

MICHIGAN  
STATE HIGHWAY DEPARTMENT

JOHN C. MACKIE  
STATE HIGHWAY COMMISSIONER

PLANS OF PROPOSED BRIDGES  
MICHIGAN PROJECT I-75-4 (20) 293  
GRAYLING - INDIAN RIVER ROAD  
CHEBOYGAN COUNTY  
ELLIS TOWNSHIP

| SHEET NO. | DESCRIPTION                 |
|-----------|-----------------------------|
| 1         | TITLE SHEET                 |
| 2         | GENERAL PLAN OF SITE        |
| 3         | GENERAL PLAN OF STRUCTURE   |
| 4         | BILL OF MATERIAL            |
| 5         | ABUTMENT DETAILS            |
| 6         | PIER DETAILS                |
| 7         | SUPERSTRUCTURE DETAILS      |
| 8         | SUPERSTRUCTURE DETAILS      |
| 9         | SUPERSTRUCTURE DETAILS      |
| 10        | SUPERSTRUCTURE DETAILS      |
| 11        | STRUCTURAL STEEL DETAILS    |
| 12        | STRUCTURAL STEEL DETAILS    |
| 13        | EXPANSION DAM DETAILS       |
| 14        | STEEL REINFORCEMENT DETAILS |

|     |  |
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| 9   | SUPERSTRUCTURE DETAILS   |
| 10  | SUPERSTRUCTURE DETAILS   |
| 11  | STRUCTURAL STEEL DETAILS   |
| 12  | STRUCTURAL STEEL DETAILS   |
| 13  | EXPANSION DAM DETAILS  |
| 14  | STEEL REINFORCEMENT DETAILS  |
| 104 | ALUMINUM RAILING, DRAIN CASTING, BAR CHAIR MOLDING AND BEVEL DETAILS |

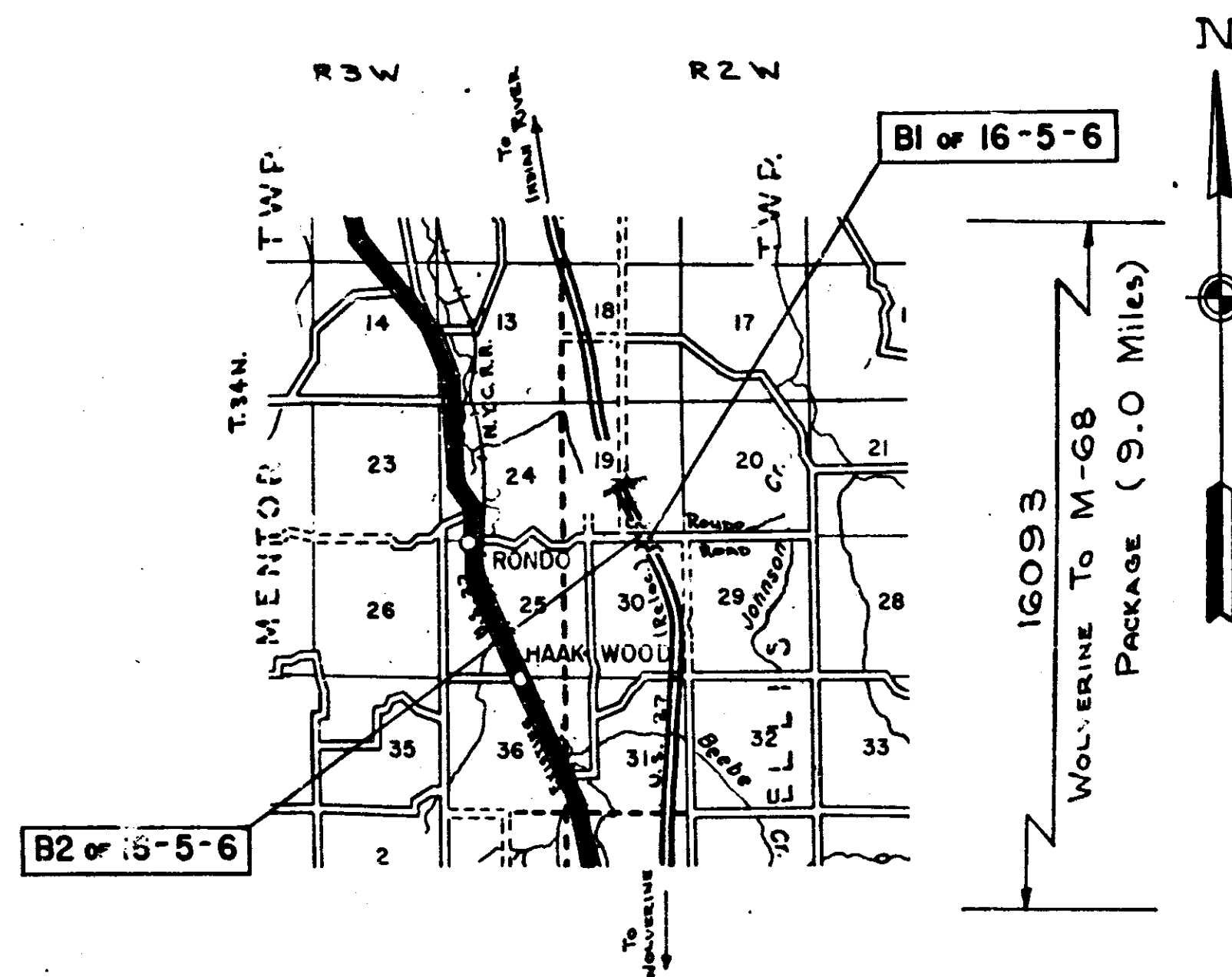
NOTE:  
Where the following items are called for on the Plans, they are to be constructed according to the Standard Plan given below opposite each item, unless otherwise indicated.

STANDARD PLANS TO BE PRINTED

| SHEET NO. | TITLE                         |
|-----------|-------------------------------|
| SP2D      | STANDARD SLOPE PAVING DETAILS |
|           |                               |
|           |                               |

STANDARD PLANS NOT TO BE PRINTED

| SHEET NO. | TITLE |
|-----------|-------|
|           |       |
|           |       |
|           |       |



GENERAL NOTES

Except where otherwise indicated on these Plans or in the Proposal and Supplemental Specifications contained therein, all materials and workmanship shall be in accordance with the Michigan State Highway Department's Standard Specifications for Road and Bridge Construction, 1960 Edition.

The design of this structure is based on the Michigan State Highway Department's Specifications for the design of Highway Bridges, 1958 Edition, H15-44 Loading, Live load plus impact deflection =  $1/800$  of span length.

The character of all materials and the extent thereof as shown by borings has been obtained by methods and from sources believed to be reliable. The exactness of this information is, however, in no case guaranteed. Boring samples are on file in the Design Office at Lansing and are available for inspection.

All exposed concrete corners shown square on the Plans shall be beveled with  $1/2"$  triangular moldings except as otherwise noted.

The stationing as shown on these plans for the intersection of the Survey centerline and Bridge Construction centerline of Rondo Road and the Survey centerline of U.S.-27 (Relocated) is believed to be correct. It shall, however, be checked at time of starting construction and if the stationing shown on the plans is incorrect it shall be reported to the Design Office at Lansing and the structure shall be staked out using the actual intersection of the Survey centerline and Bridge Construction centerline of Rondo Road and the Survey centerline of U.S.-27 (Relocated) as the control point.

CONTROL SECTION NO. 16093RN

CONTRACT FOR G & DS, Surf. & Str.

|                          |                                    |
|--------------------------|------------------------------------|
| DIVISION APPROVAL        |                                    |
| CHECKED                  | ENGINEER OF DESIGN                 |
| RECOMMENDED FOR APPROVAL | ENGINEER OF BRIDGE AND ROAD DESIGN |
| RECOMMENDED FOR APPROVAL | TRAFFIC ENGINEER                   |

|                                    |                       |
|------------------------------------|-----------------------|
| OFFICES OF DESIGN AND CONSTRUCTION |                       |
| APPROVED                           | CONSTRUCTION ENGINEER |
| APPROVED                           | CHIEF DESIGN ENGINEER |

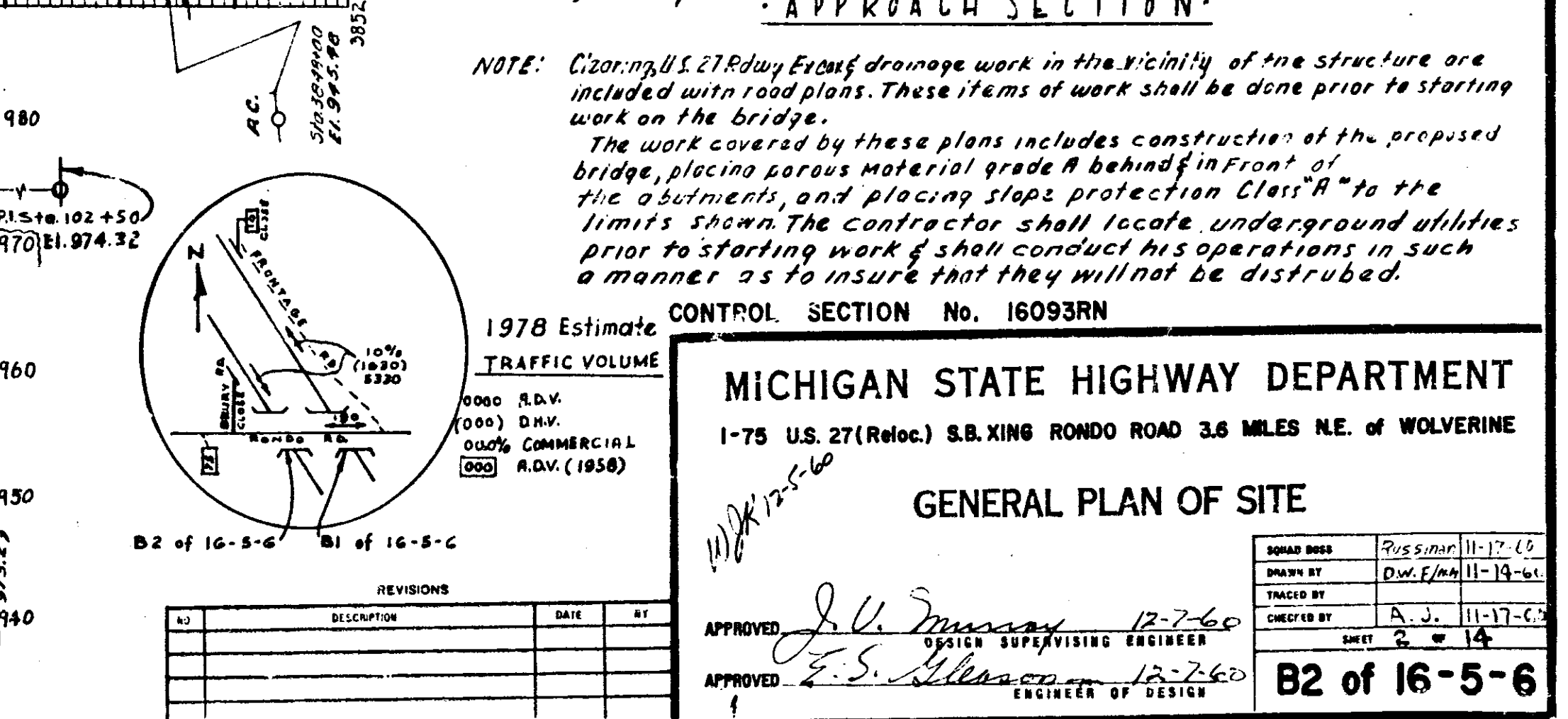
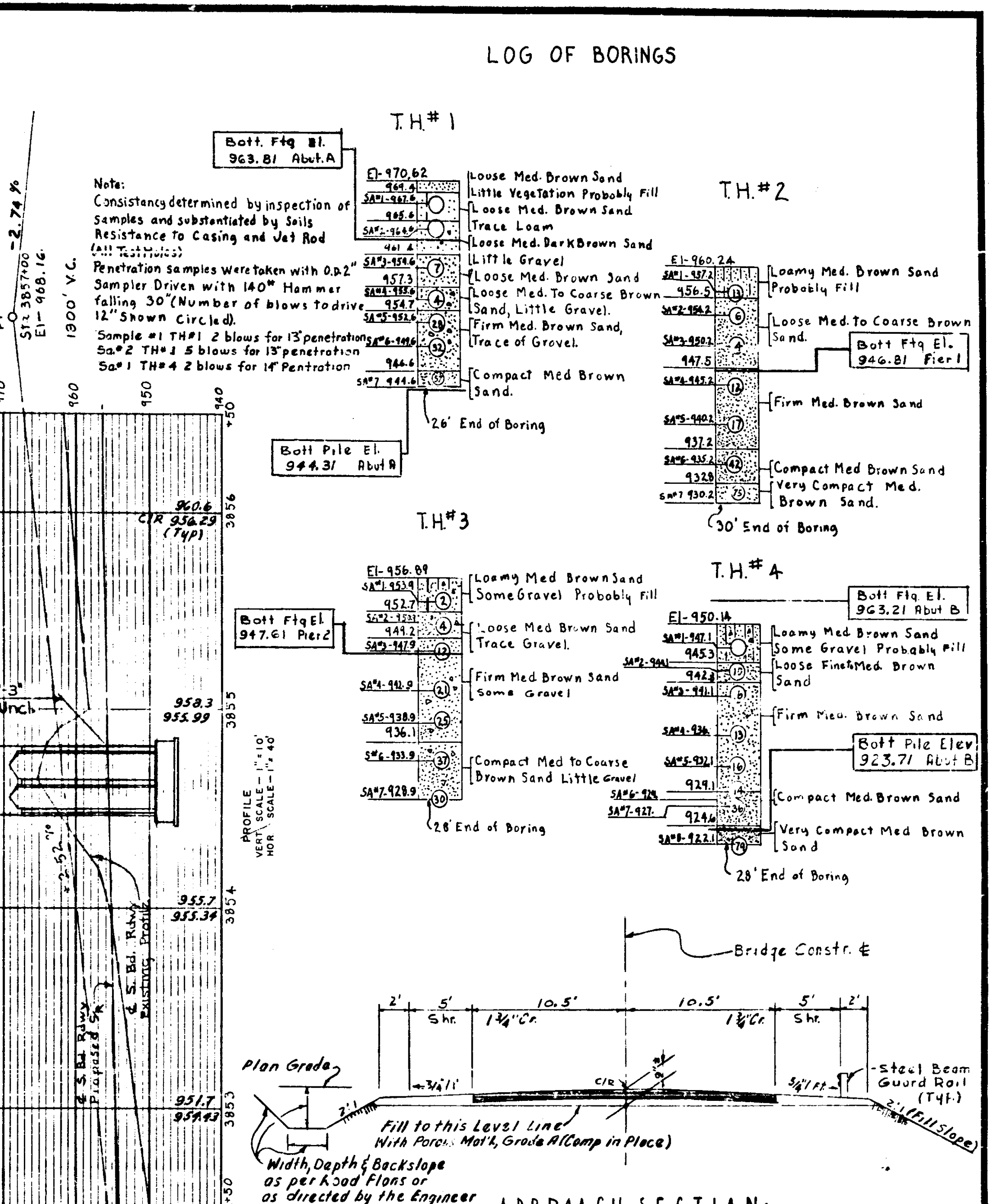
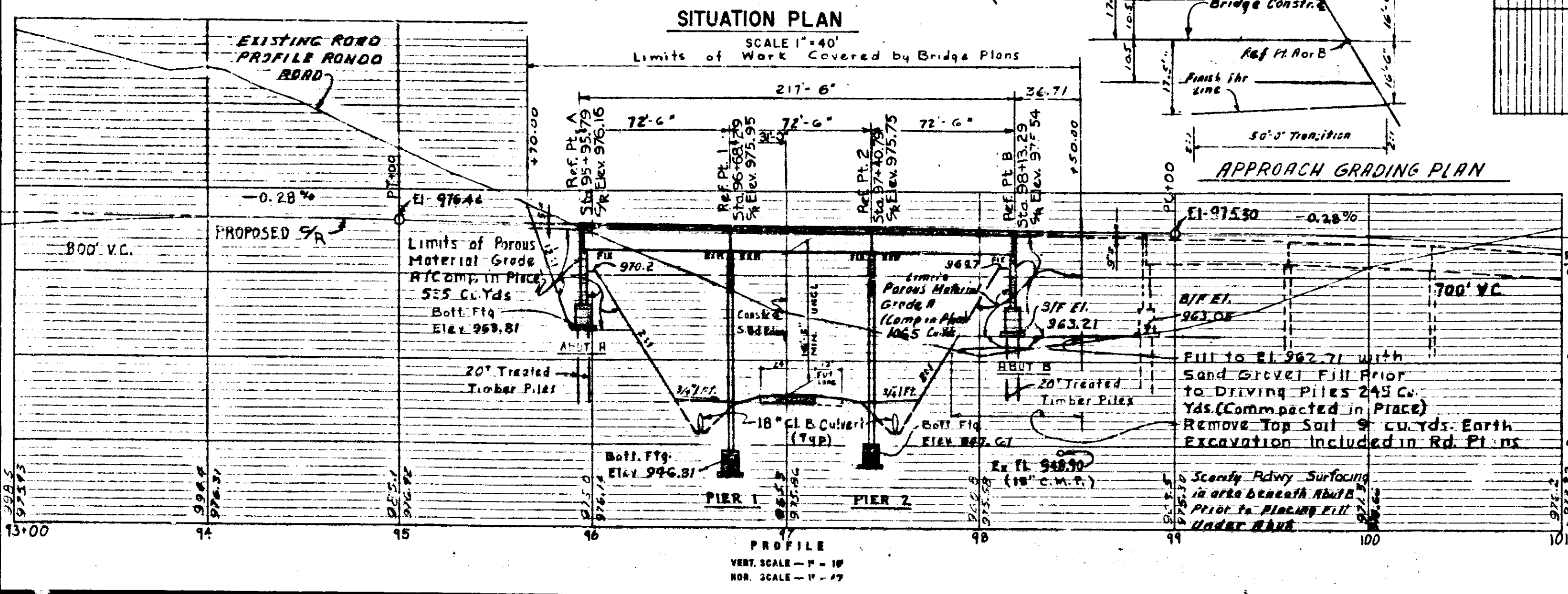
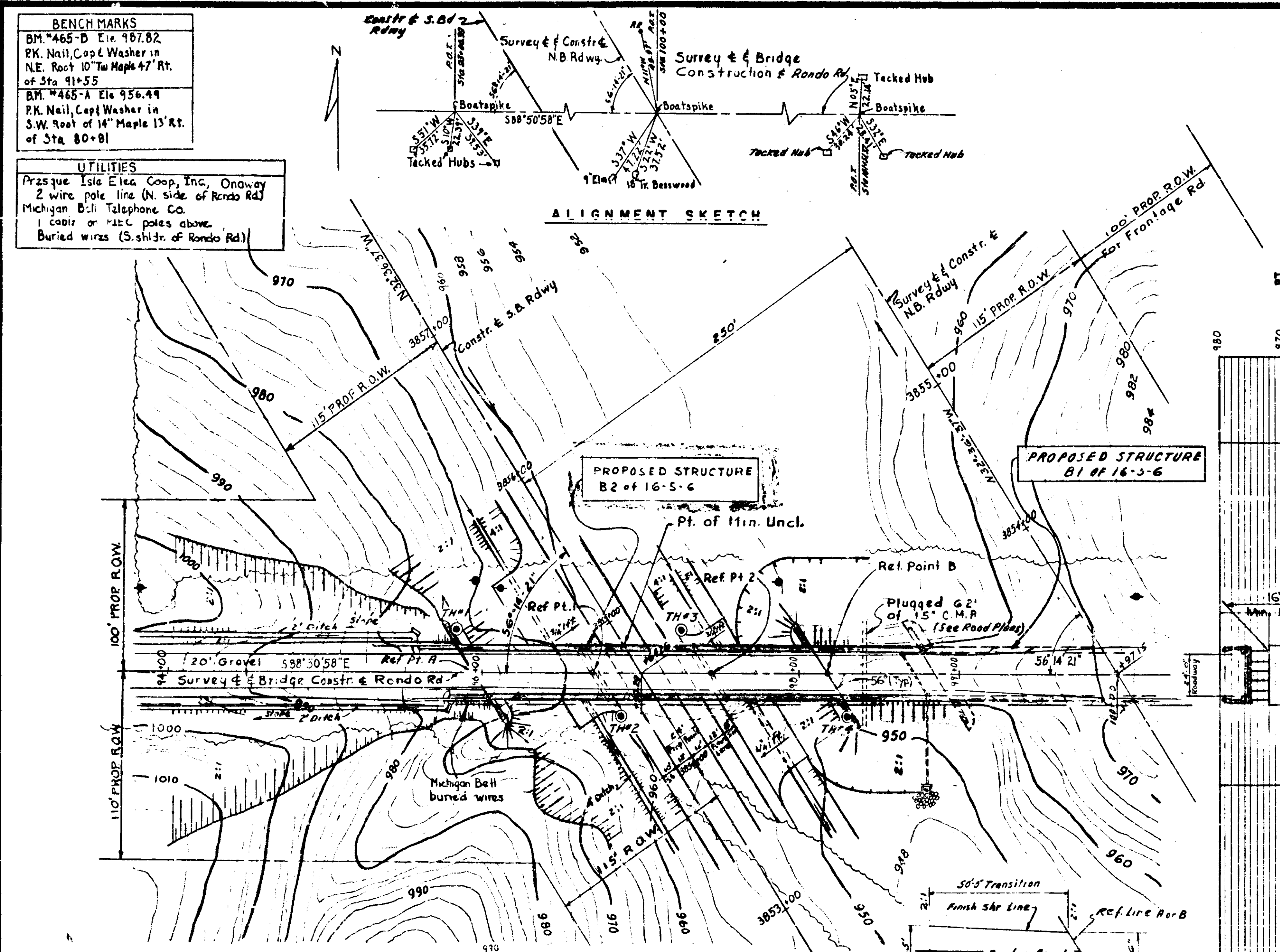
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|-----------------------------------|--|
| STATE HIGHWAY DEPARTMENT APPROVAL |  |
| APPROVED                          | JOHN C. MACKIE<br>STATE HIGHWAY COMMISSIONER |
| BY                                | DIRECTOR OF ENGINEERING / CHIEF ENGINEER     |

|                                       |  |
|---------------------------------------|--|
| PLANS PREPARED BY                     | DEPARTMENT OF COMMERCE<br>BUREAU OF PUBLIC ROADS |
| MICHIGAN<br>STATE<br>HIGHWAY<br>DEPT. | APPROVED<br>DIVISION ENGINEER                    |

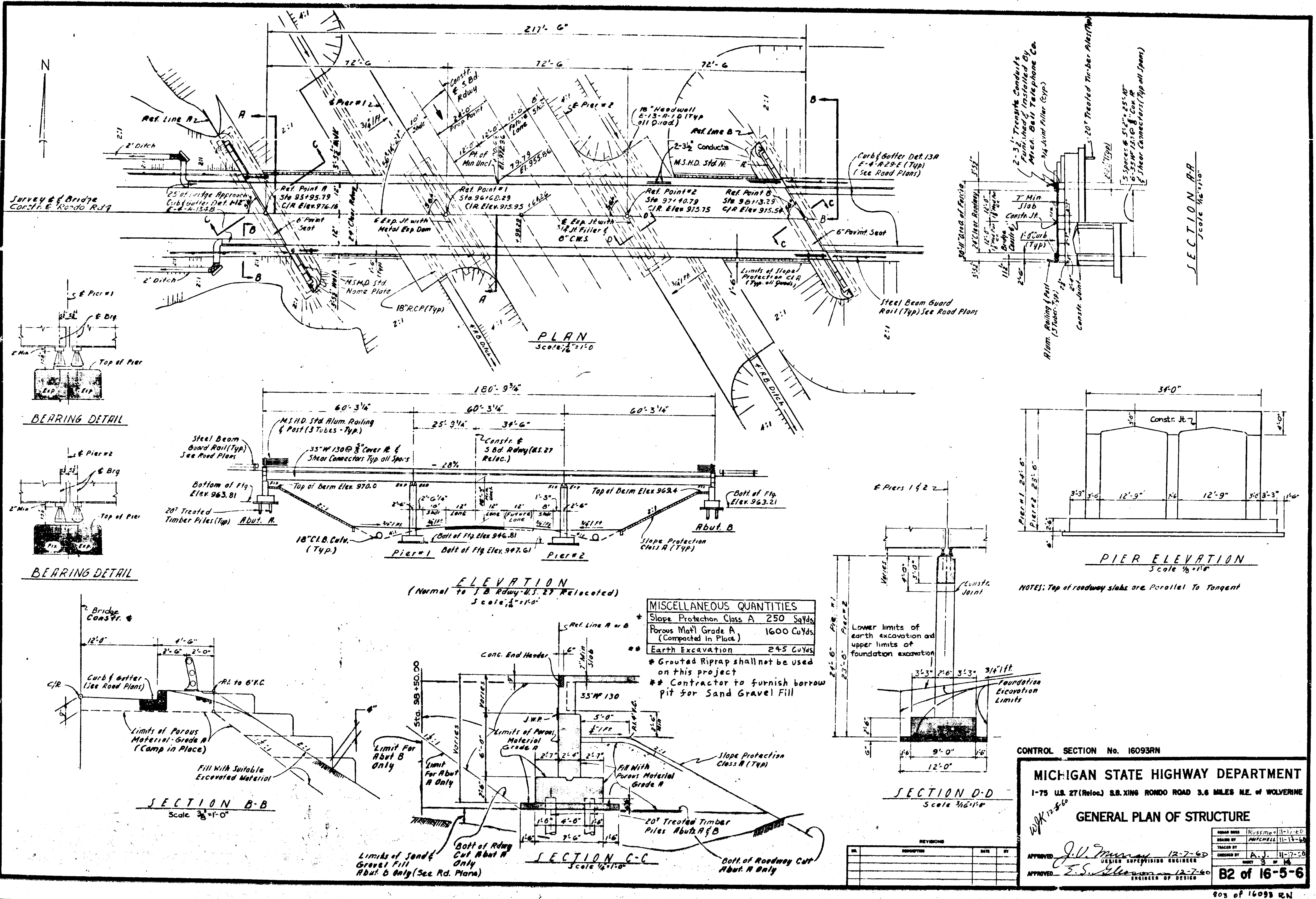
FILE NO. 16093  
B1 & B2 of 16-5-6

**BENCH MARKS**  
 BM #465-B Elev. 907.82  
 P.K. Nail, Cap & Washer in  
 N.E. Root 10" Maple 47' Rt.  
 of Sta 91+55  
 BM #465-A Elev. 956.44  
 P.K. Nail, Cap & Washer in  
 S.W. Root of 14" Maple 13' Rt.  
 of Sta 80+81

**UTILITIES**  
 Prizque Isle Elec. Coop., Inc., Onway  
 2 wire pole line (N. side of Rondo Rd)  
 Michigan Bell Telephone Co.  
 1 cable or 12" c. poles above  
 Buried wires (S. side of Rondo Rd)







| ITEM  | UNIT     | QUANTITY | DATE        |             |              |             |             | Totals | PLAN EXTRAS |             |      |                      |
|---|----------|----------|-------------|-------------|--------------|-------------|-------------|--------|-------------|-------------|------|----------------------|
|   |          |          | A<br>8/7/61 | B<br>8/7/61 | C<br>9/24/61 | D<br>3/4/63 | E<br>5/6/63 |        | DATE        | DESCRIPTION | UNIT | QUANTITY<br>ESTIMATE |
| BRIDGE  |          |          |             |             |              |             |             |        |             |             |      |                      |
| Earth Excavation  | Cu. Yds. | 245      |             |             |              |             | -626        |        |             |             |      | 871                  |
| Unclassified Excavation                                 | Cu. Yds. | 300      |             | +21         |              |             |             |        |             |             |      | 521                  |
| Treated Timber Piles-Furnished                          | Lin. Ft. | 1566     |             | -418        |              |             |             |        |             |             |      | 1150                 |
| Treated Timber Piles-Driven                             | Lin. Ft. | 1440     |             | -4861       |              |             |             |        |             |             |      | 953.9                |
| Cutoff-Treated Timber Piles                             | Each     | 48       |             |             |              |             |             |        |             |             |      | 48                   |
| Treated Timber Test Piles                               | Each     | 4        |             |             |              |             |             |        |             |             |      | 4                    |
| Grade A (6A) Concrete-Substructure                      | Cu. Yds. | 205      |             |             |              |             |             |        |             |             |      | 205                  |
| Grade A (6B) Concrete-Substructure                      | Cu. Yds. | 128.6    |             |             |              |             |             |        |             |             |      | 128.6                |
| Grade A (6B) Concrete-Superstructure                    | Cu. Yds. | 238.9    |             |             | +13.7        |             |             |        |             |             |      | 244.6                |
| Cement  | Bbls.    | 808      |             |             | +32          |             |             |        |             |             |      | 840                  |
| Steel Reinforcement                                     | Lbs.     | 64029    |             |             |              |             |             |        |             |             |      | 64029                |
| Structural Steel Fabrication & Erection                 | Lbs.     | 209,100  |             | -1564       |              |             |             |        |             |             |      | 207,536              |
| Shear Connectors  | Lump Sum | L.S.     |             |             |              |             |             |        |             |             |      | Lump Sum             |
| 1/2" Joint Filler                                       | Sq. Ft.  | 92       |             |             |              |             |             |        |             |             |      | 92                   |
| 3/4" Joint Filler                                       | Sq. Ft.  | 61       |             |             |              |             |             |        |             |             |      | 61                   |
| Hot-Poured Rubber-Asphalt Type Filler                   | Lin. Ft. | 74       |             |             |              |             |             |        |             |             |      | 74                   |
| Joint Waterproofing                                     | Sq. Ft.  | 280      |             |             |              |             |             |        |             |             |      | 280                  |
| Copper  | Lbs.     | 180      |             |             |              |             |             |        |             |             |      | 180                  |
| Aluminum Bridge Railing-Fabrication & Erection (3 tube) | Lin. Ft. | 435      |             |             |              |             |             |        |             |             |      | 435                  |
| Field Painting  | Lump Sum | L.S.     |             |             |              |             |             |        |             |             |      | Lump Sum             |
| Slope Protection Class A                                | Sq. Yds. | 250      |             |             | +42          |             |             |        |             |             |      | 292                  |
| Porous Material Grade A (Comp. in Place)                | Cu. Yds. | 1600     |             |             |              |             | -626        |        |             |             |      | 974                  |

Balanced by G.E.D. 5/29/63  
CKD-F.O.C. - 5/29/63

MICHIGAN STATE HIGHWAY DEPARTMENT

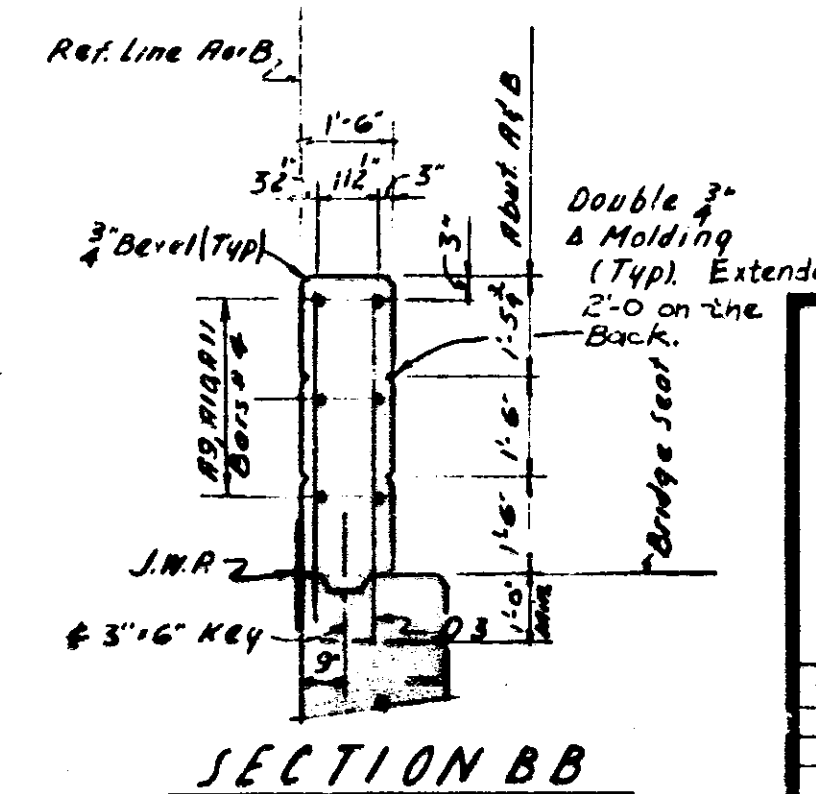
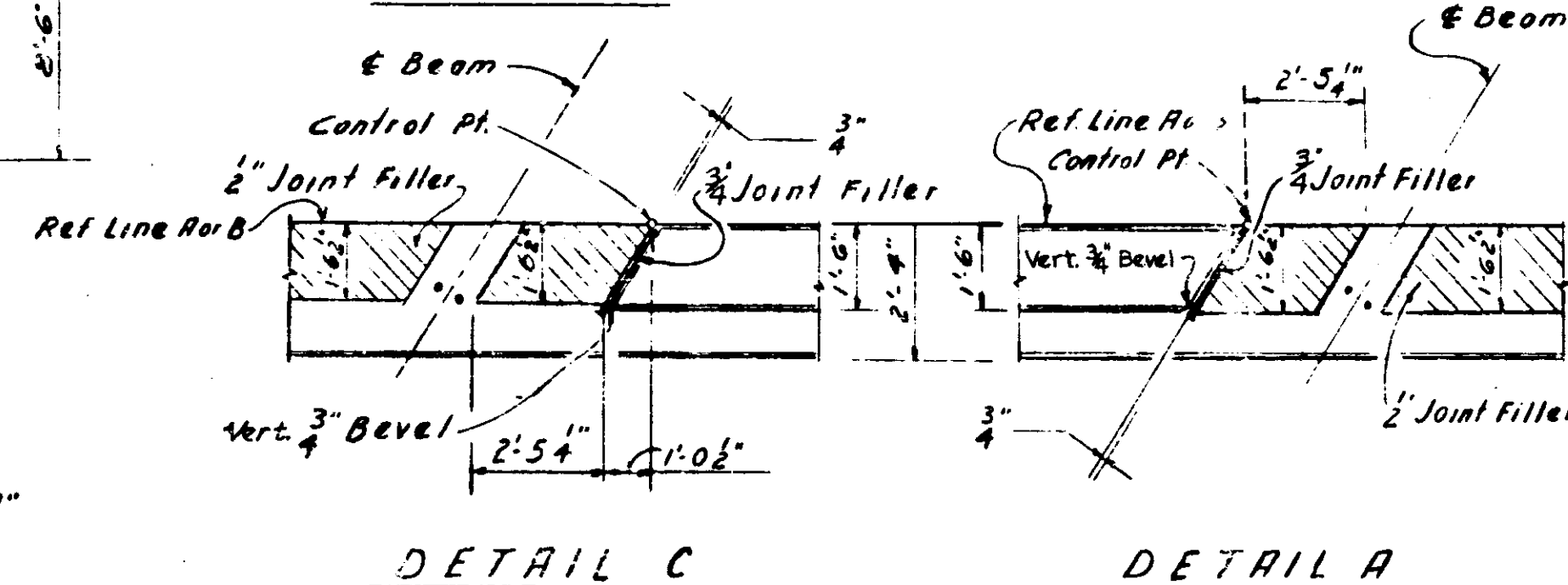
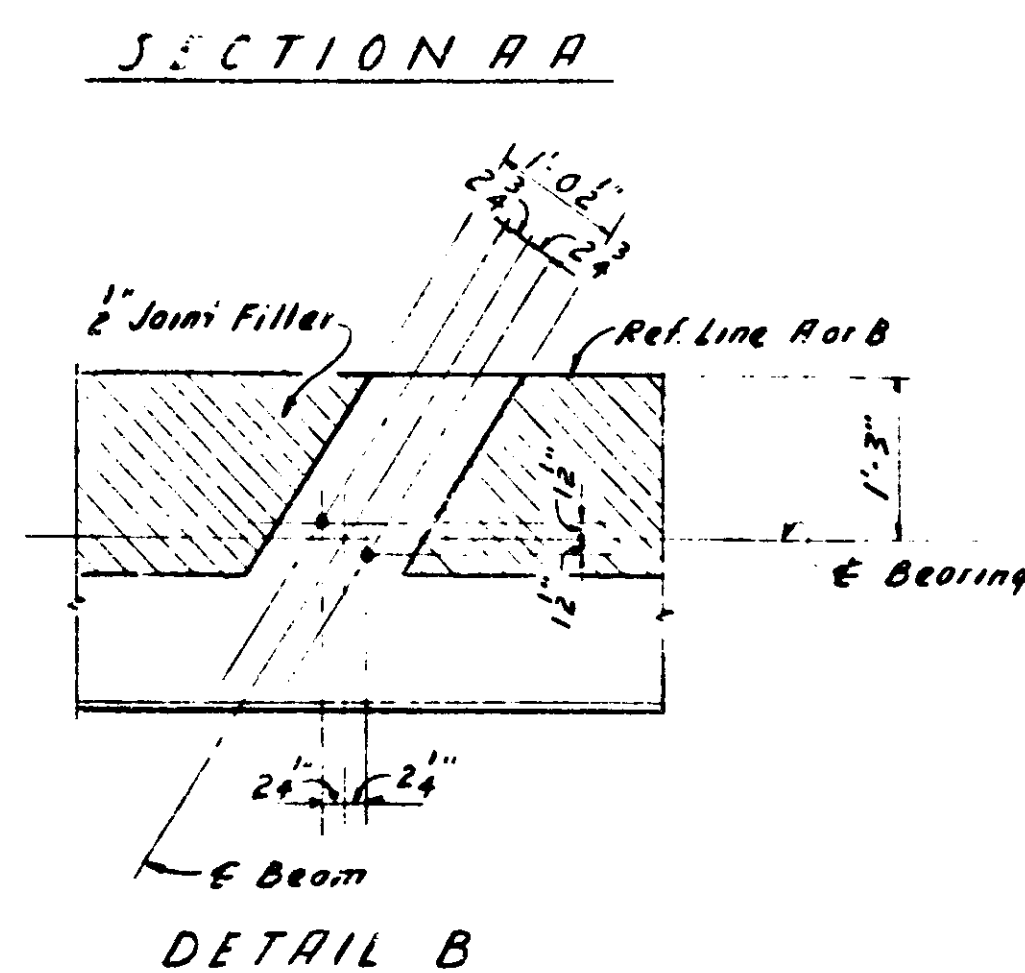
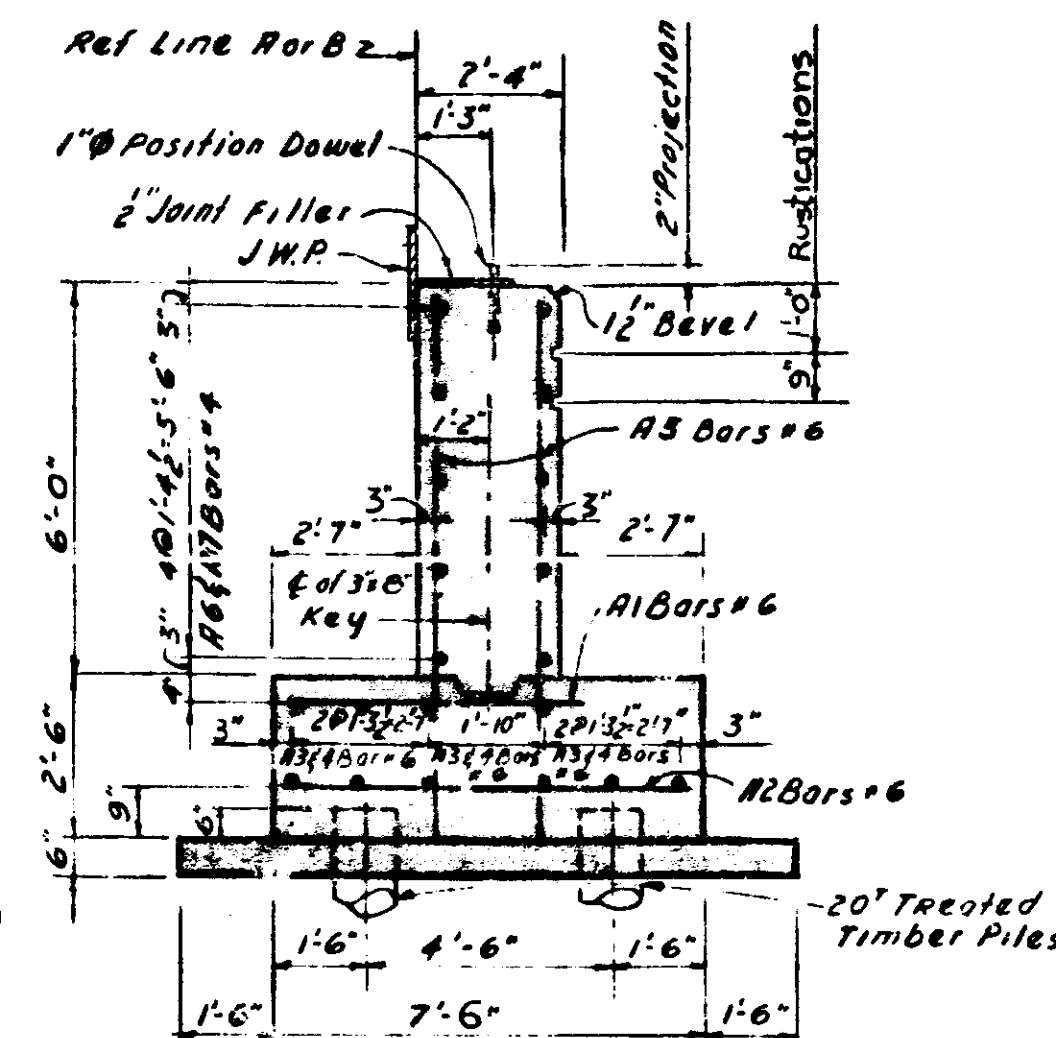
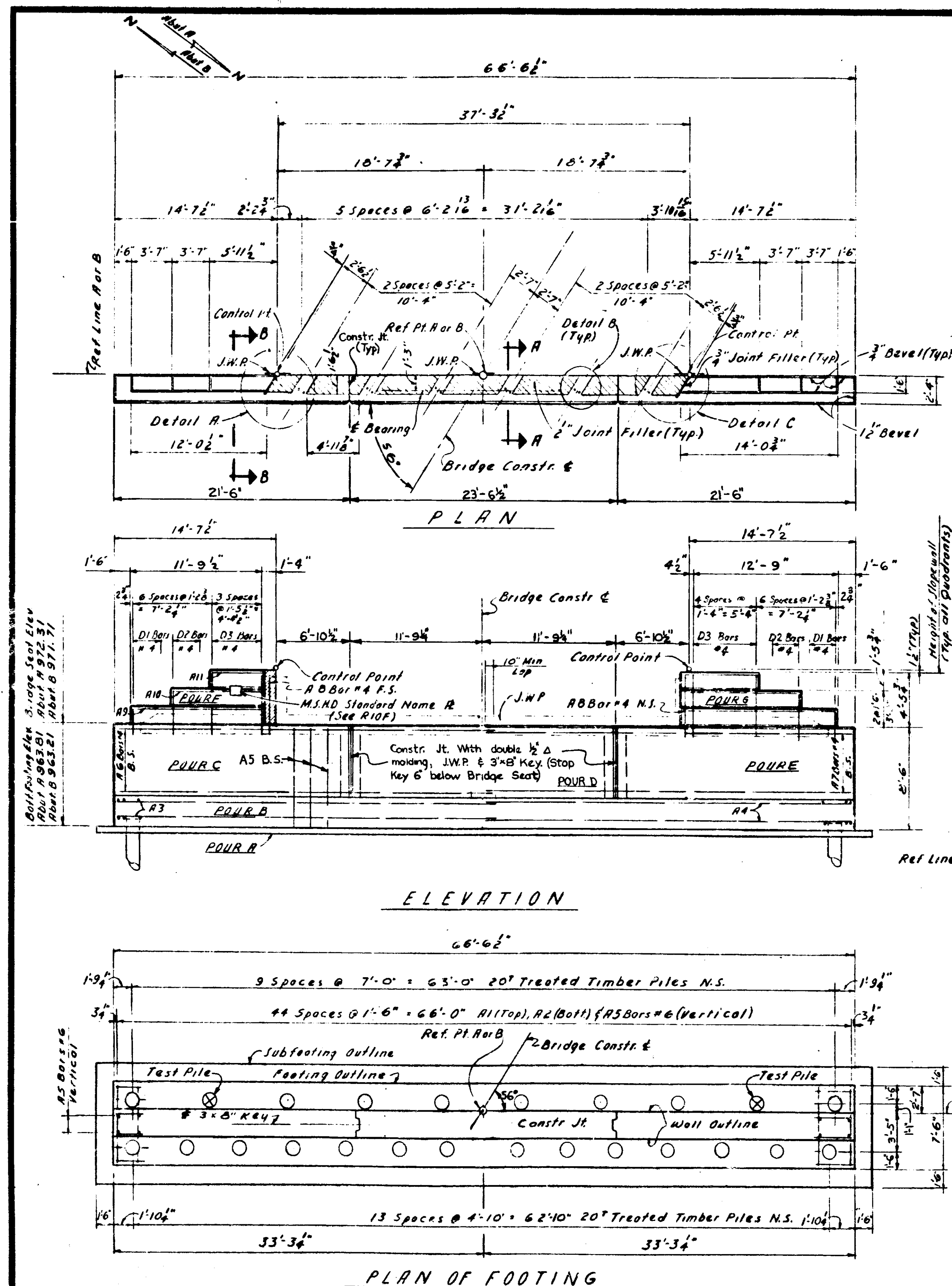
BILL OF MATERIAL

|             |                      |
|-------------|----------------------|
| DESIGNED BY | PROVISIONAL NO. 9-60 |
| DRAWN BY    | F.O.C. 11-5-60       |
| CHECKED BY  | A.J. 12-2-60         |
| SHEET       | 4 of 14              |

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803 of 16093





| QUANTITY TREATED TIMBER PILES |        |            |                 |                 |                |                 |                  |                     |        |
|-------------------------------|--------|------------|-----------------|-----------------|----------------|-----------------|------------------|---------------------|--------|
| LOCATION                      | TYPE   | NO<br>PROD | EACH PILE       |                 | CUTOFF<br>EACH | TOTAL           |                  | CUTOFF<br>ELEVATION |        |
|                               |        |            | Perin<br>Lin PF | Drain<br>Lin PF |                | Perin<br>Lin PF | Cutoff<br>Lin PF |                     |        |
| ABUT<br>A                     | ○ Vert | 22         | 22              | 20              | 1              | 484             | 440              | 22                  | 964.31 |
|                               | ⊗ Test | 2          | 30              | 20              | 1              | 60              | 40               | 2                   | 964.31 |
|                               |        |            |                 |                 |                |                 |                  |                     |        |
|                               |        |            |                 |                 |                |                 |                  |                     |        |
|                               | Total  | 24         |                 |                 |                | 544             | 480              | 24                  |        |
| ABUT<br>B                     | ○ Vert | 22         | 42              | 40              | 1              | 924             | 880              | 22                  | 963.71 |
|                               | ⊗ Test | 2          | 50              | 40              | 1              | 100             | 80               | 2                   | 963.71 |
|                               |        |            |                 |                 |                |                 |                  |                     |        |
|                               |        |            |                 |                 |                |                 |                  |                     |        |
|                               | Total  | 24         |                 |                 |                | 1024            | 960              | 24                  |        |
|                               |        |            |                 |                 |                |                 |                  |                     |        |
| Grand Total/Abut A+B          |        | 48         |                 |                 |                | 1568            | 1440             | 48                  |        |

| MISCELLANEOUS QUANTITIES |        |          |          |                     |
|--------------------------|--------|----------|----------|---------------------|
| ITEM                     | UNIT   | AMOUNT   |          | Total Amount<br>A+B |
|                          |        | Amount A | Amount B |                     |
| Joint Waterproofing      | Sq.Ft. | 140      | 140      | 280                 |
| 1/2" Joint Filler        | Sq.Ft. | 45.9     | 45.9     | 92                  |
| 3/4" Joint Filler        | Sq.Ft. | 16.7     | 16.7     | 33                  |
|                          |        |          |          |                     |
|                          |        |          |          |                     |
|                          |        |          |          |                     |
|                          |        |          |          |                     |
|                          |        |          |          |                     |

NOTES:  
Adjustments are similar except where noted  
J.W.P. denotes joint waterproofing  
N.S. denotes nearside  
F.S. denotes forside  
B.S. denotes bothsides  
Slope walls are to be cast after  
superstructure is complete to top of sidewalk.  
Position dowels shall be set accurately to a template.  
The bridge seat shall be finished to a true plane of the  
elevation shown and shall not vary more than  $1/8"$  under  
a ten foot straight edge (not more than  $1/16"$  under any  
bearing).  
All piles shall be driven to a minimum bearing capacity  
of 20 tons  
For bevel & molding details, see sheet \* R10F

| GRADE A     | CONCRETE QUANTITIES - Cu Yds |       |         |       |
|-------------|------------------------------|-------|---------|-------|
| POUR        | ABOUT A                      |       | ABOUT B |       |
|             | A(40)                        | A(60) | A(60)   | A(60) |
| A           | 15.2                         |       | 13.2    |       |
| B           | 45.3                         |       | 45.8    |       |
| C           |                              | 11.1  |         | 11.1  |
| D           |                              | 11.2  |         | 12.2  |
| E           |                              | 11.1  |         | 11.1  |
| F           |                              | 2.2   |         | 2.2   |
| G           |                              | 2.5   |         | 2.5   |
|             |                              |       |         |       |
|             |                              |       |         |       |
| TOTAL CUB   | 59                           | 39.1  | 59      | 39.1  |
| TOTAL A(60) | 118.0                        |       |         |       |
| TOTAL A(60) | 78.2                         |       |         |       |

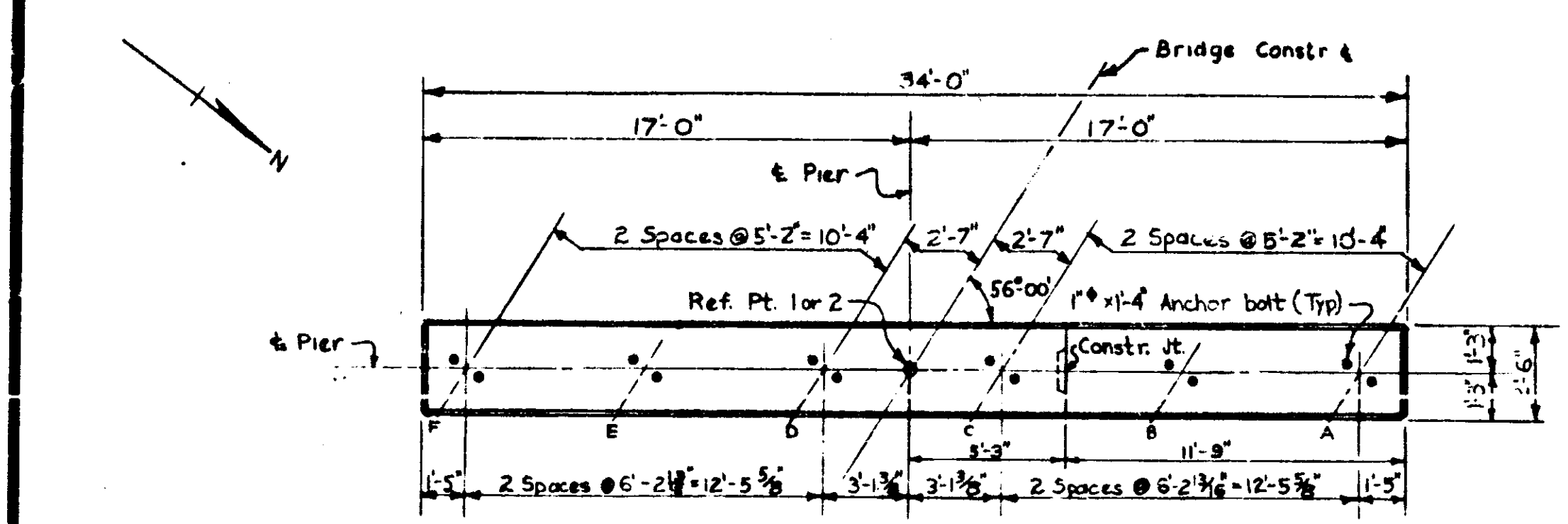
# MICHIGAN STATE HIGHWAY DEPARTMENT

## ABUTMENT DETAILS

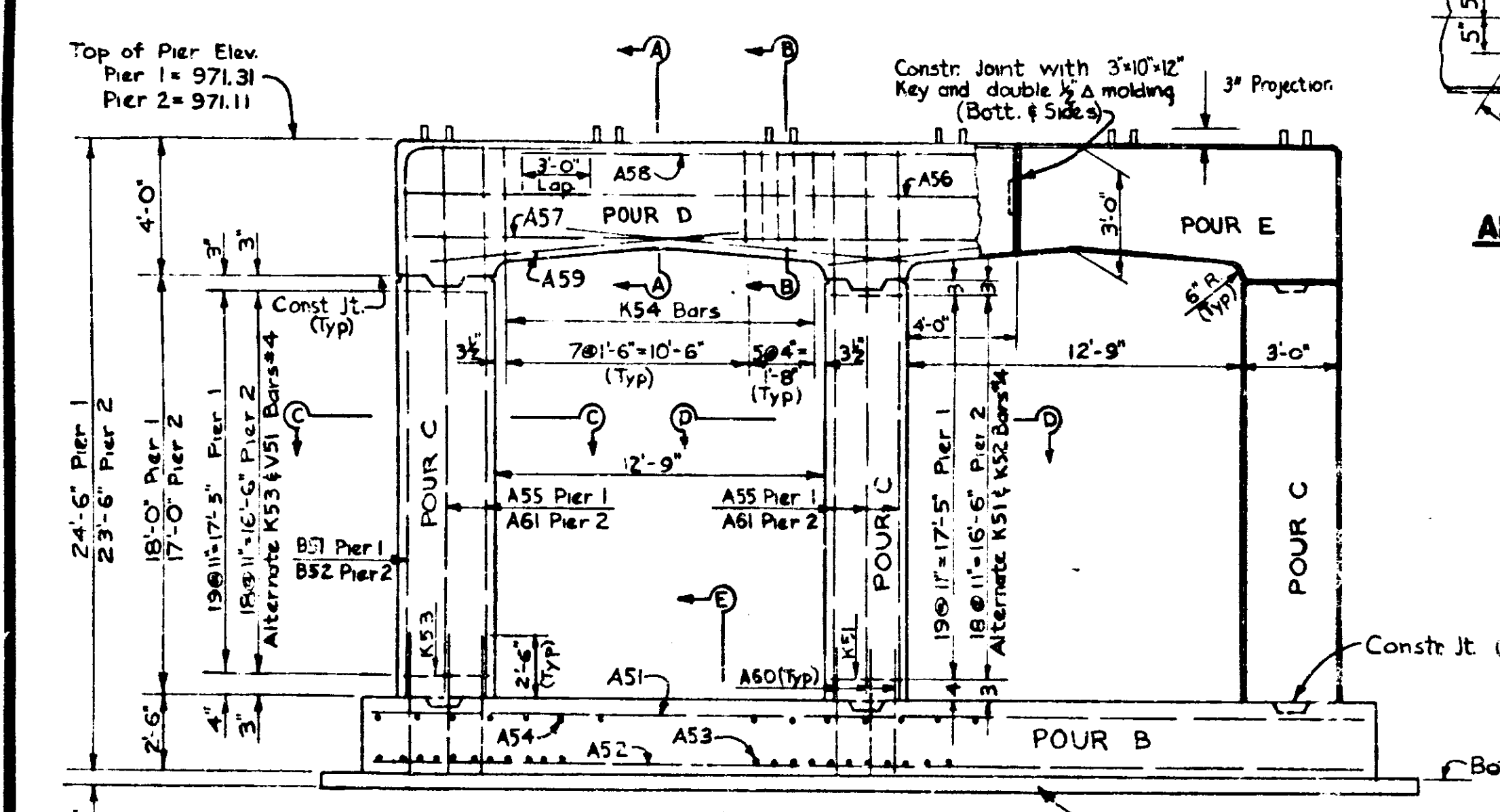
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|-----------|-------------|------|----|
| NO.       | DESCRIPTION | DATE | BY |
|           |             |      |    |
|           |             |      |    |
|           |             |      |    |

|            |                  |
|------------|------------------|
| SQUAD BOSS | Russman 11-19-60 |
| DRAWN BY   | Mitchell 12/60   |
| TRACED BY  |                  |
| CHECKED BY | F.O.C. 4-17-60   |
| SHEET      | 5 OF 14          |

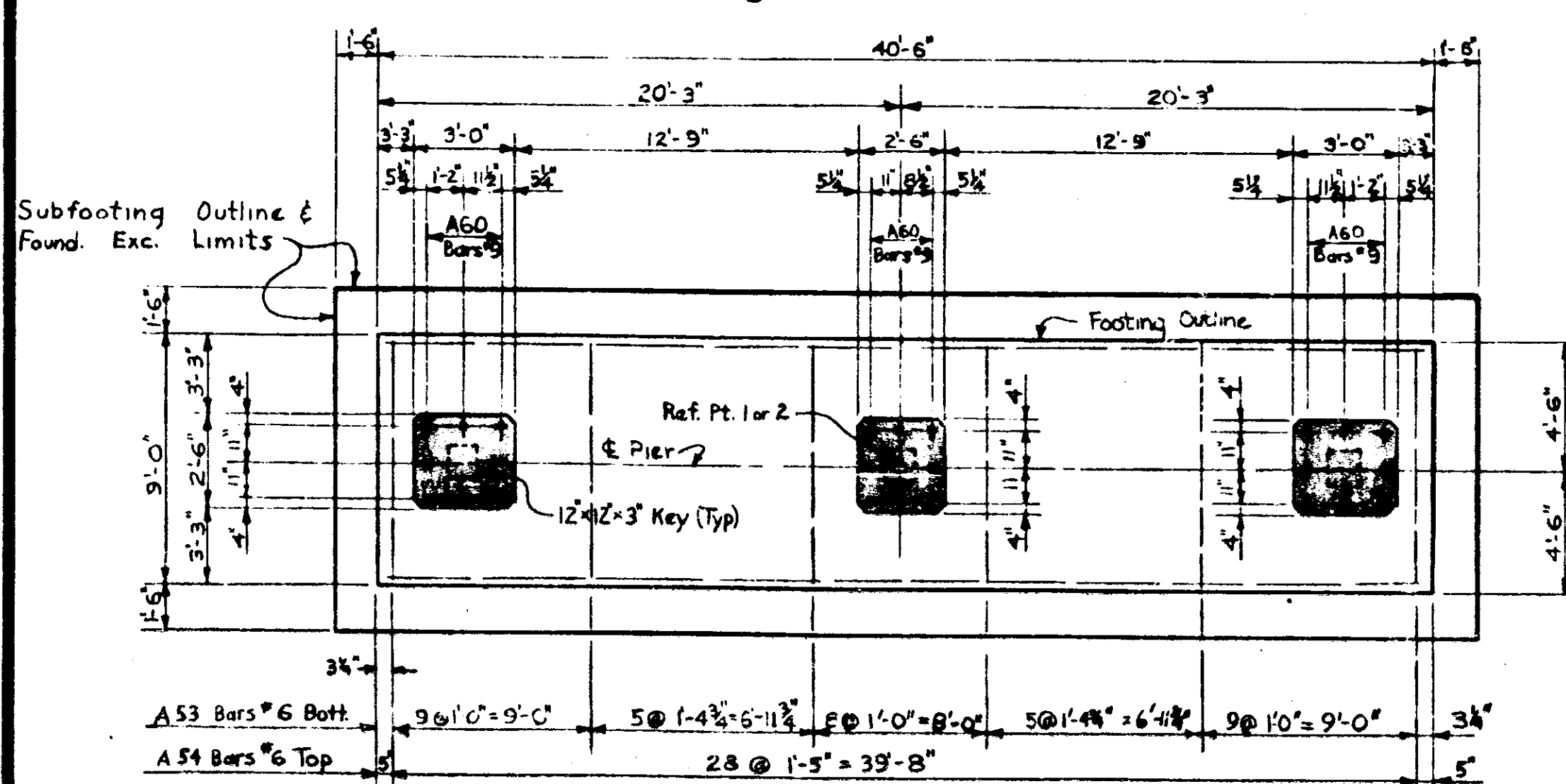
**B2 of 16-5-6**



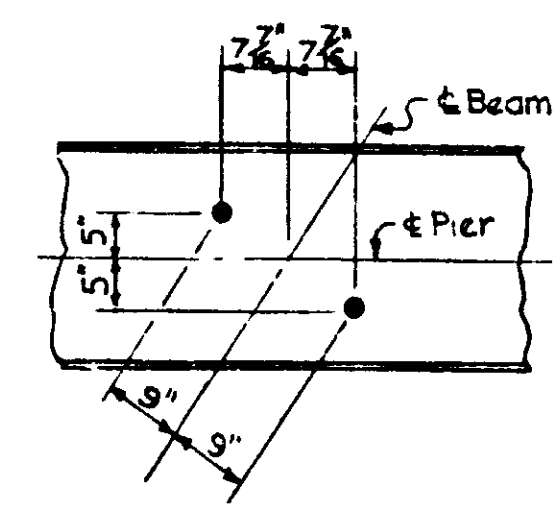
PLAN OF CAP



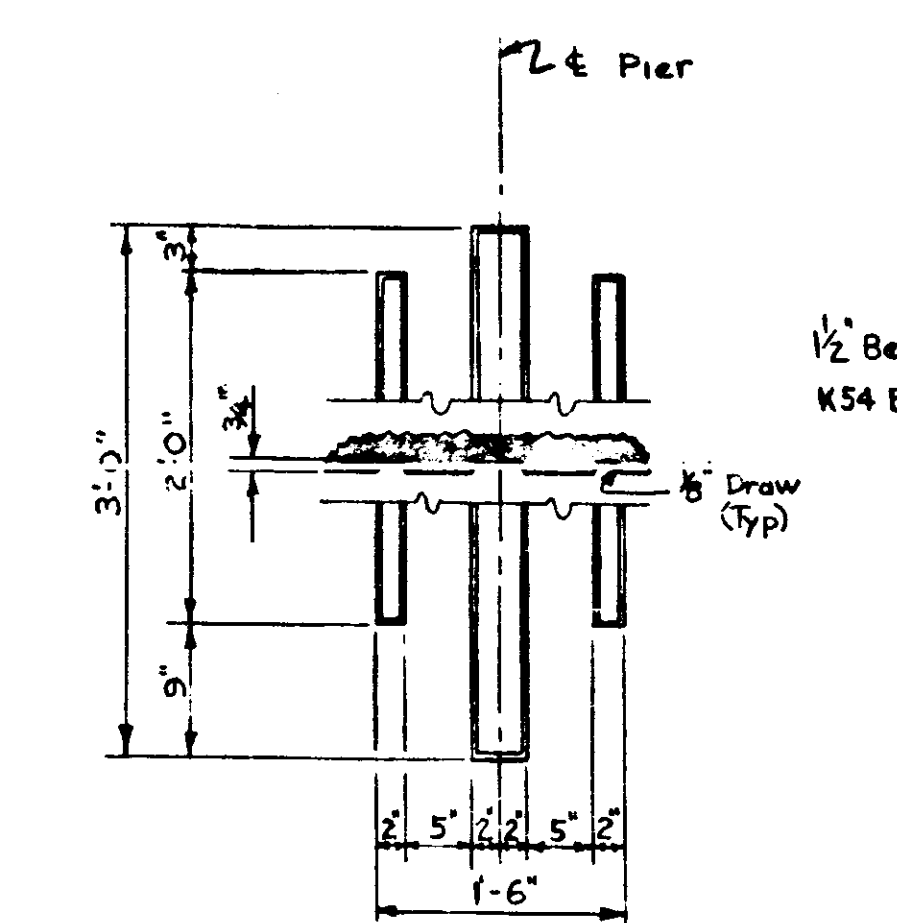
ELEVATION



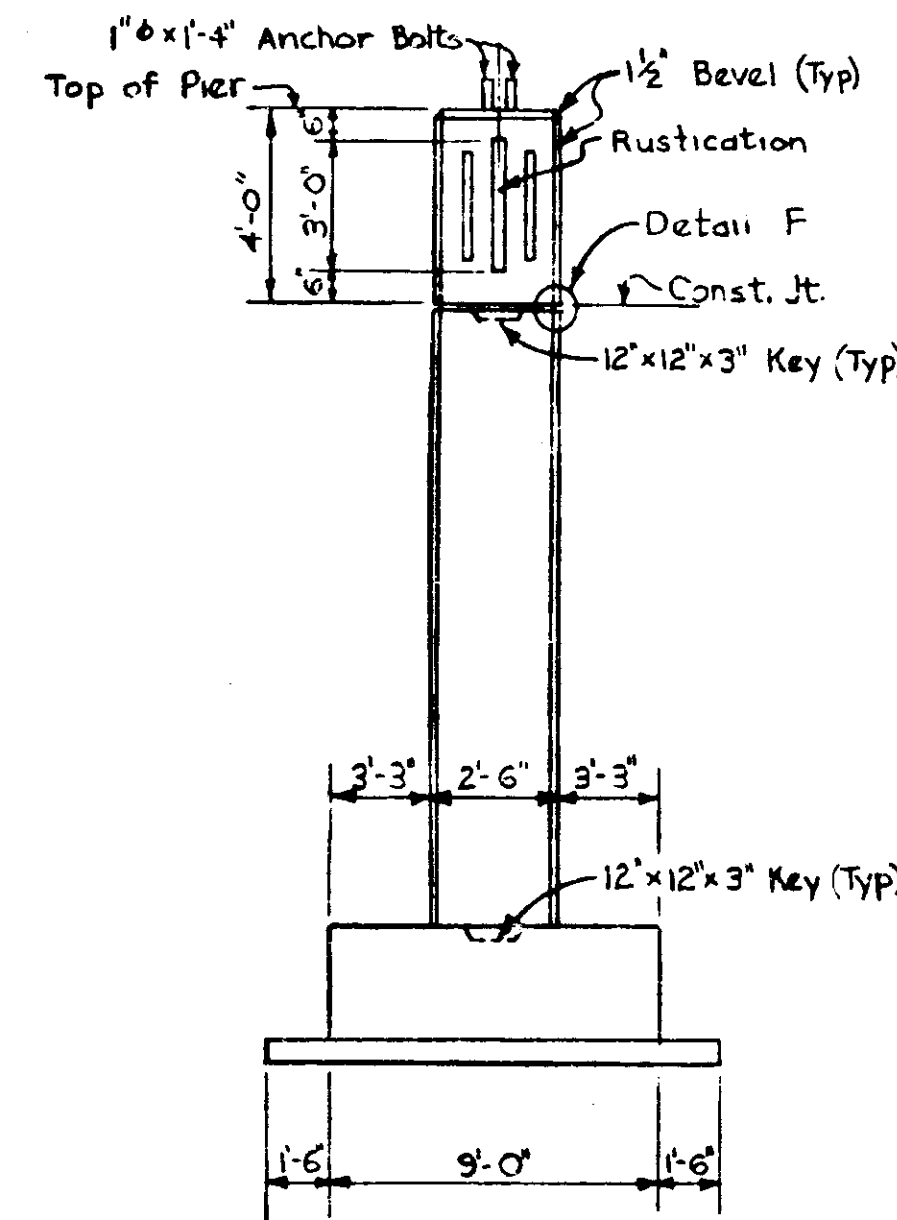
PLAN OF FOOTING



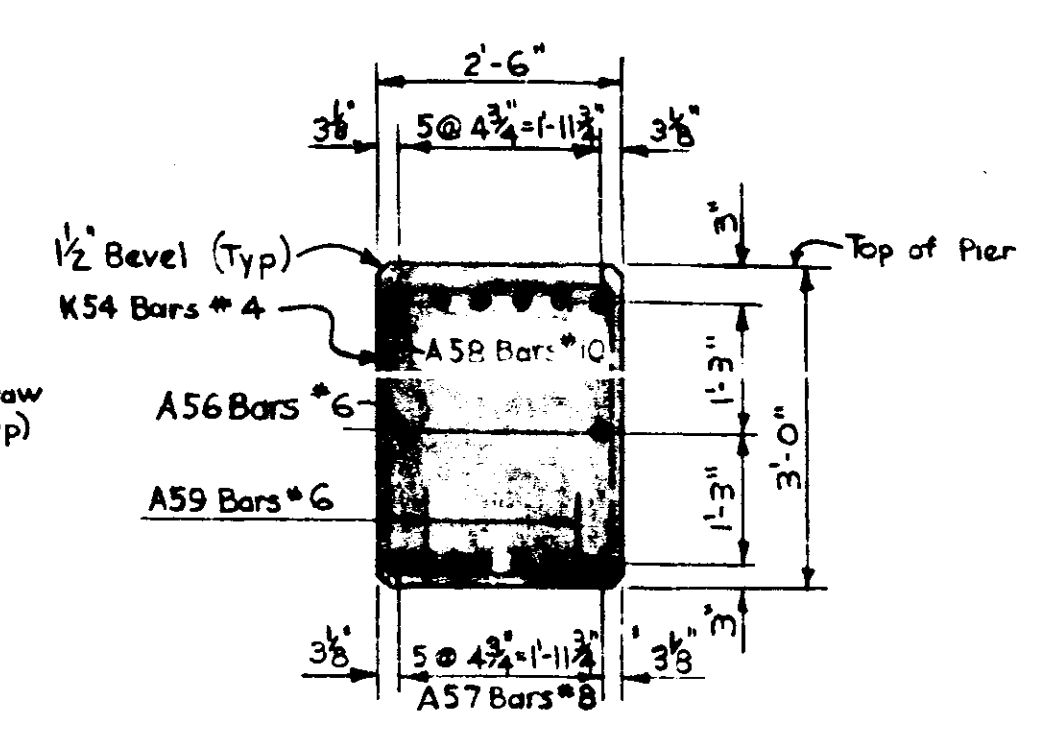
ANCHOR BOLT DETAILS



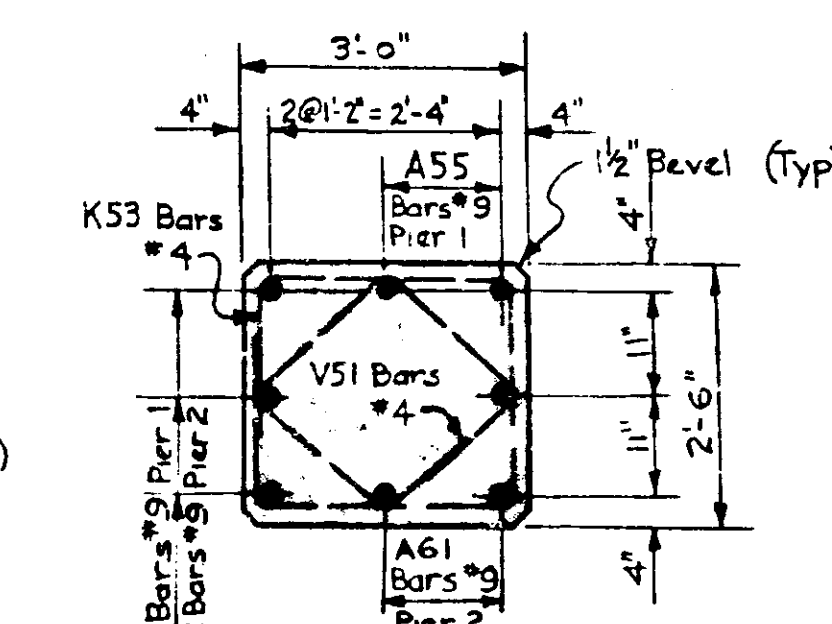
RUSTICATION DETAILS



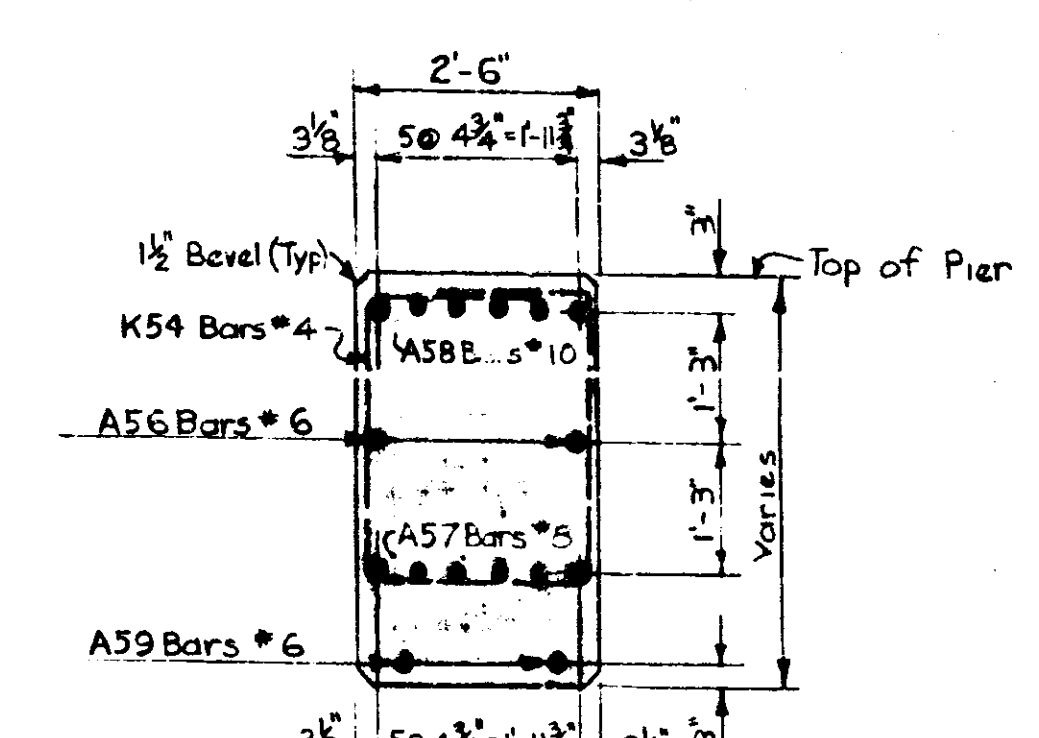
END VIEW



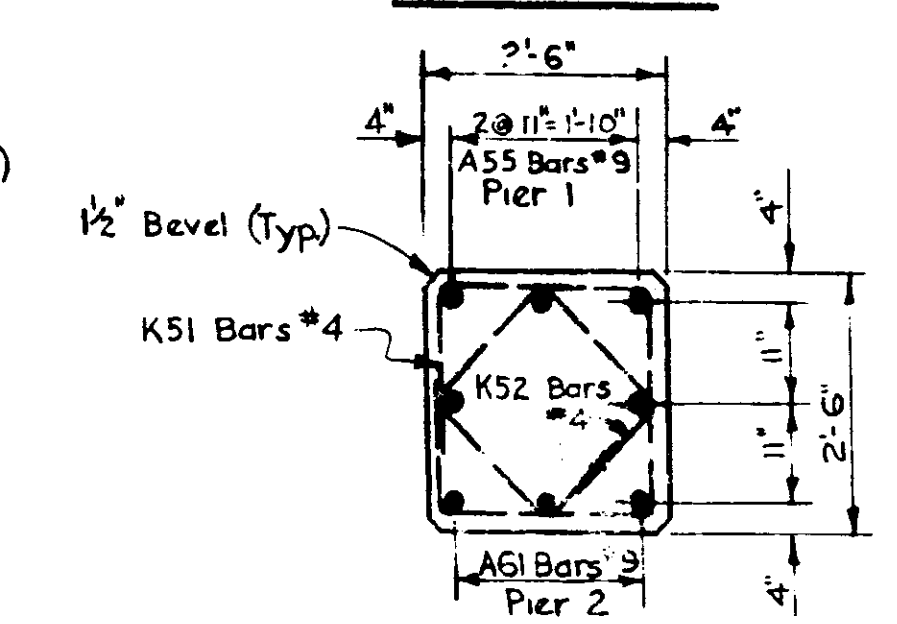
SECTION A-A



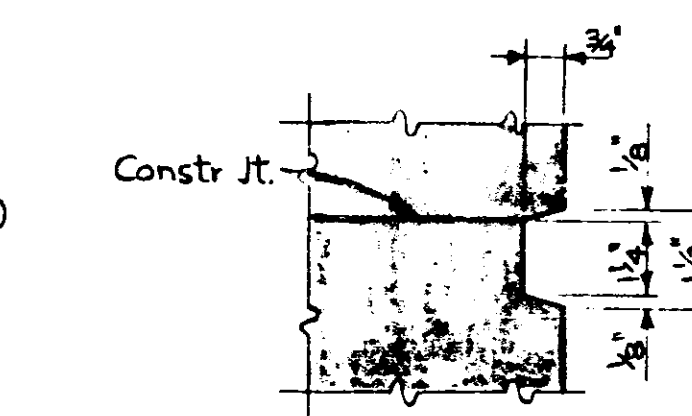
SECTION C-C



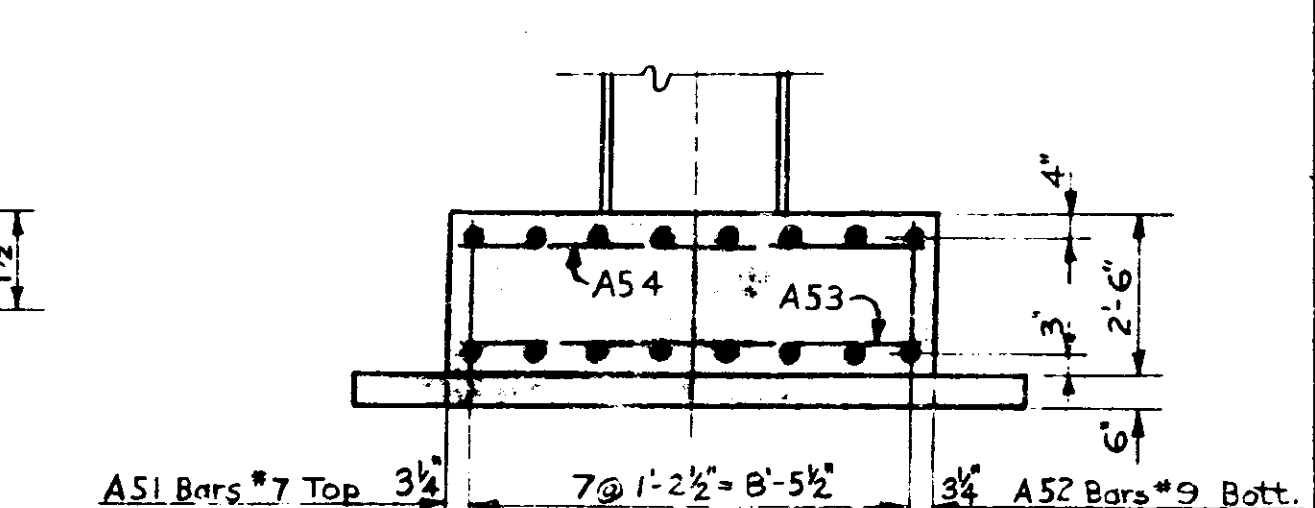
SECTION B-B



SECTION D-D



DETAIL F



SECTION E-E

Notes:  
Anchor bolts shall be set accurately to a template.  
Piers are similar except as noted.  
For Bevel & Molding details, see Std. Sh R-10-F.  
Anchor bolts are to be set accurately to a template.  
The tops of piers shall be finished to a true plane at the elevation shown and shall not vary more than 1/8" under a ten foot straight edge and not more than 1/16" under any bearing.  
Reinforcing steel spacing in girders is to be adjusted as required to facilitate setting of anchor bolts.  
This design is based on a maximum foundation pressure of 2400 pounds per square foot and a maximum average foundation pressure of 1850 pounds per square foot.  
The Project Engineer shall adjust the spacing of the reinforcing steel as required to permit placing of anchor bolts.

| MISCELLANEOUS QUANTITIES |        |        |        |       |
|--------------------------|--------|--------|--------|-------|
| ITEM                     | UNIT   | PIER 1 | PIER 2 | TOTAL |
| Foundation Excavation    | Cu Yds | 150    | 150    | 300   |

| GRADE A CONCRETE QUANTITIES - CUBIC YARDS |            |              |              |         |
|---|------------|--------------|--------------|---------|
| POUR                                      | LOCATION   | PIER #1 (6A) | PIER #2 (6B) | TOTAL   |
| A   | Subfooting | 9.7          | 9.7          |         |
| B   | Footing    | 33.8         | 33.8         |         |
| C   | Columns    |              | 14.2         | 13.4    |
| D   | Girder     |              | 7.6          | 7.6     |
| E   | Girder     |              | 3.9          | 3.9     |
| Subtotal                                  |            | 43.5         | 25.7         | 43.5    |
| Total - (6A)                              |            | 87.0         |              | cu yds. |
| Total - (6B)                              |            |              | 50.6         | cu yds. |

MICHIGAN STATE HIGHWAY DEPARTMENT

PIER DETAILS

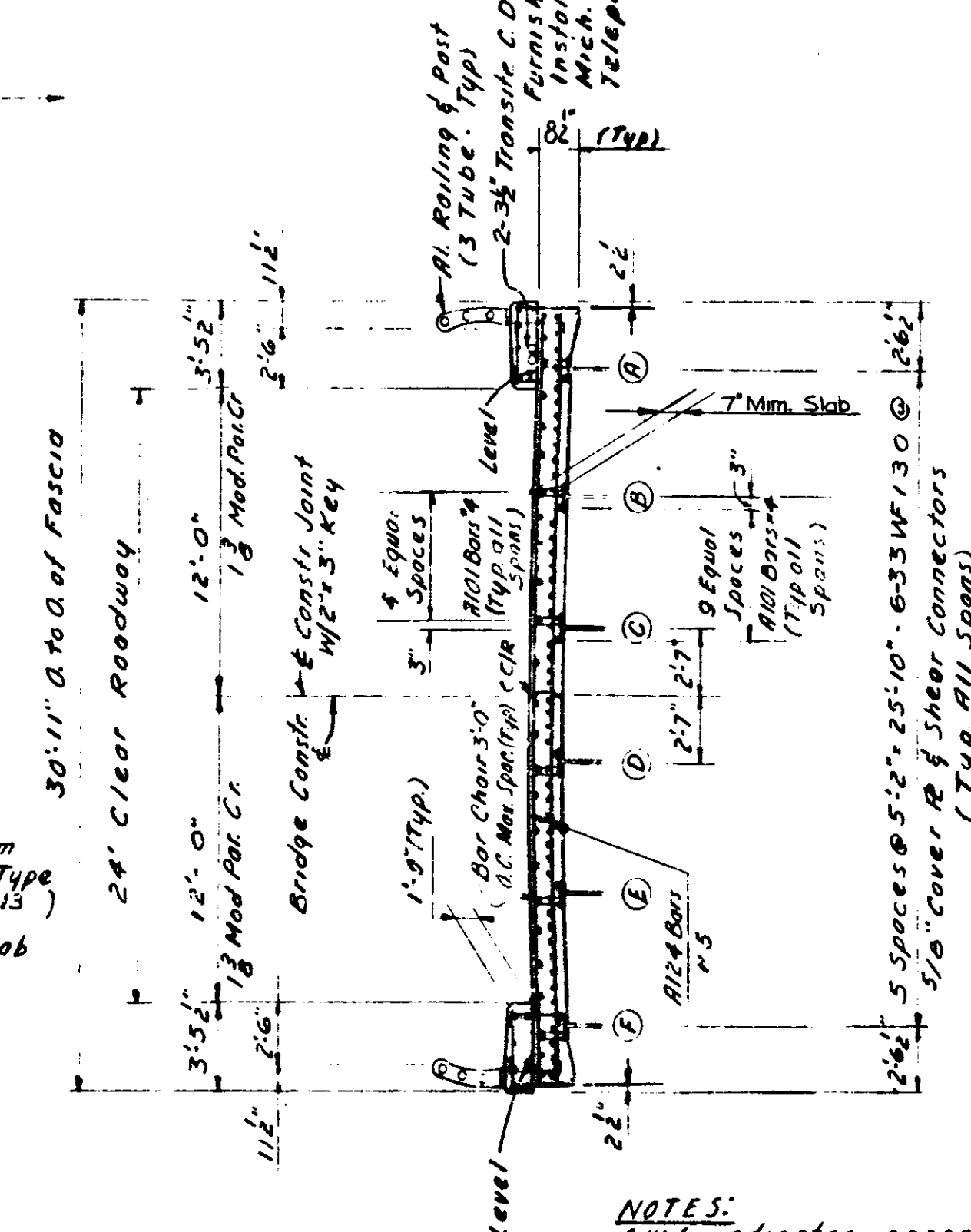
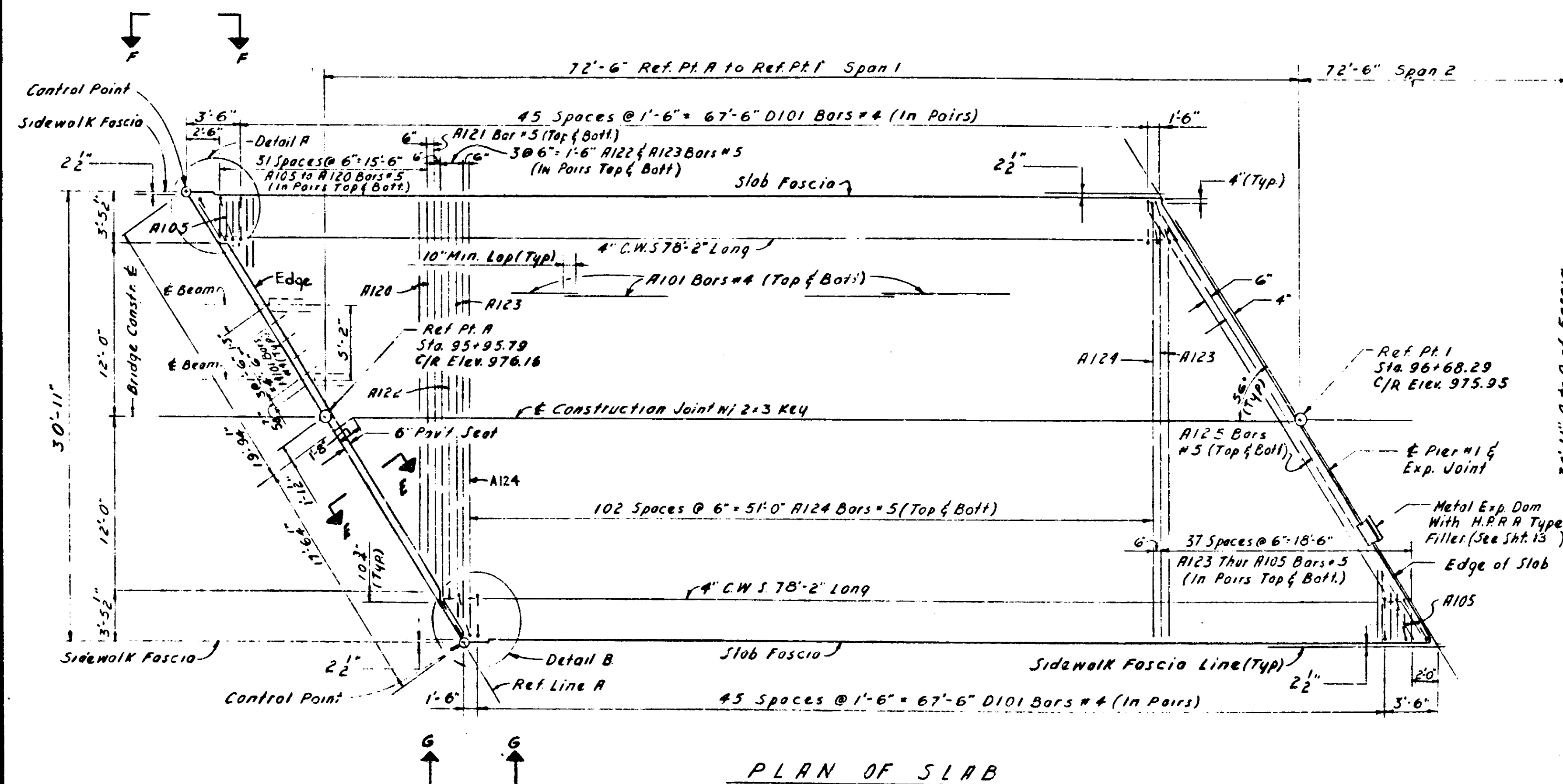
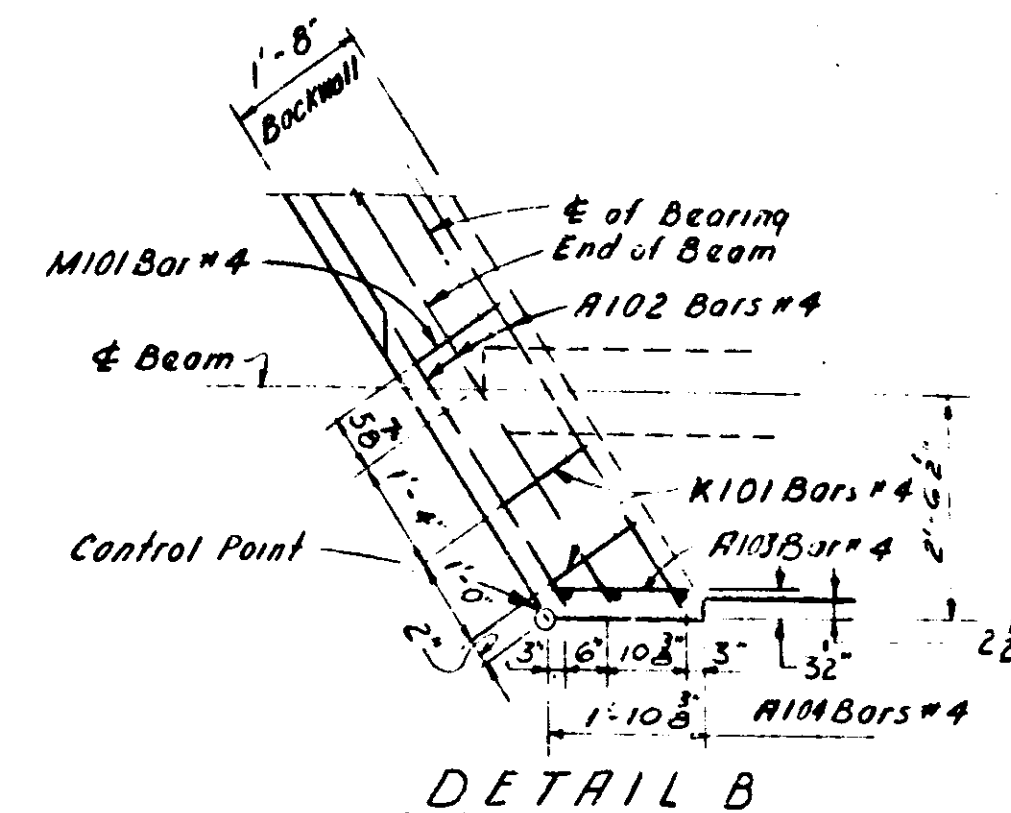
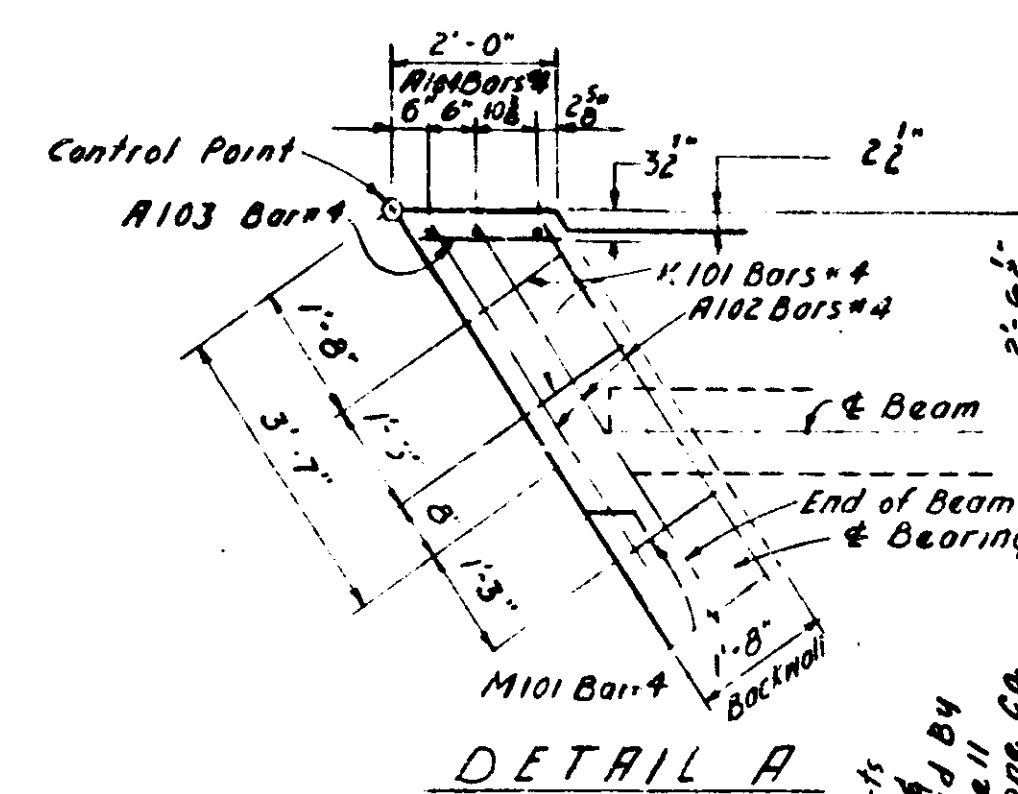
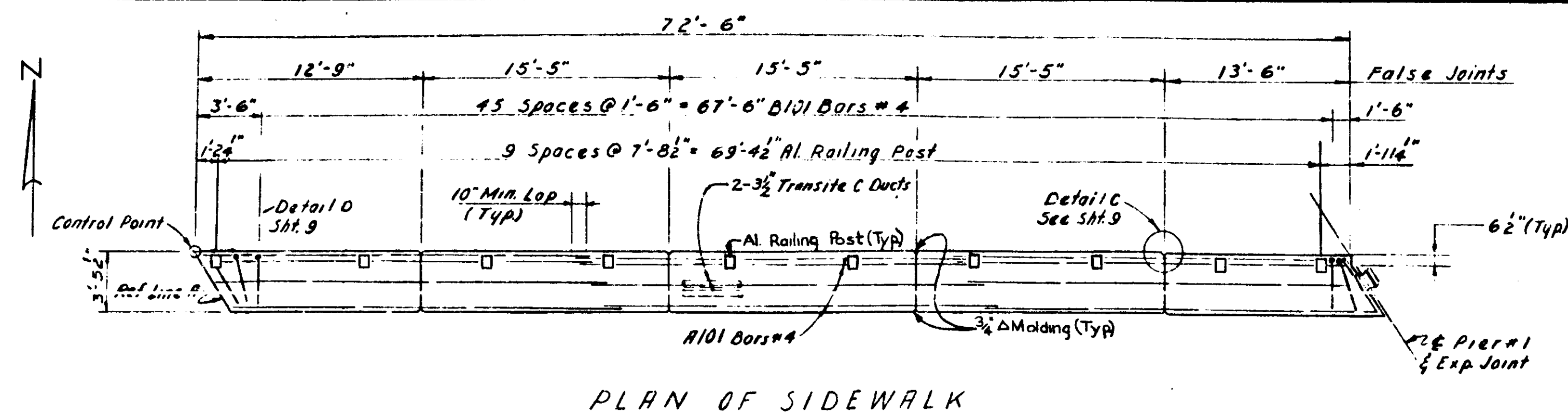
REVISIONS

| NO. | DESCRIPTION | DATE | BY |
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| 5   |             |      |    |

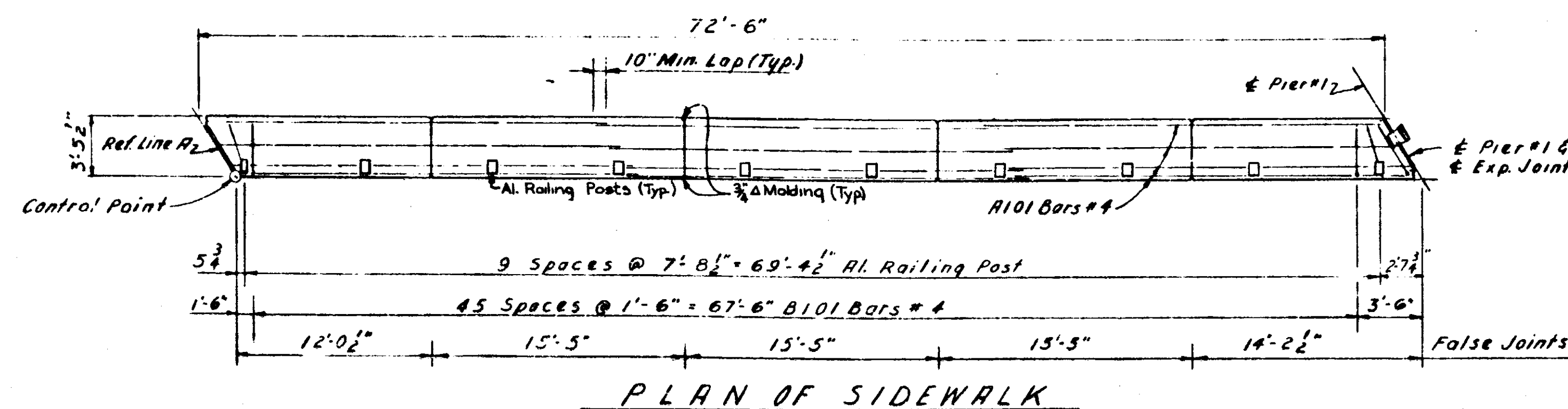
DESIGNED BY: J. S. H. 10-27-60  
DRAWN BY: F. C. 10-27-60  
CHECKED BY: R. S. 11-15-60  
DATE: 11-15-60

B2 OF 16-5-6





NOTES:  
C.W.S. indicates copper waterstop  
J.W.R. indicates joint waterstop  
For Bevel & Molding Detail See Sheet No. R10  
Edge and Groove denote Edging or Grooving with an  
approved tool  
Sidewalk pours shall not be cast until slab concrete  
has attained at least 50% of its design strength  
as determined by table in Section 3.01.0. of the  
Standard Specifications.  
A permanent camber, extending over the entire length  
of the bridge with a middle ordinate of 1" shall be  
placed in the tops of sidewalk.



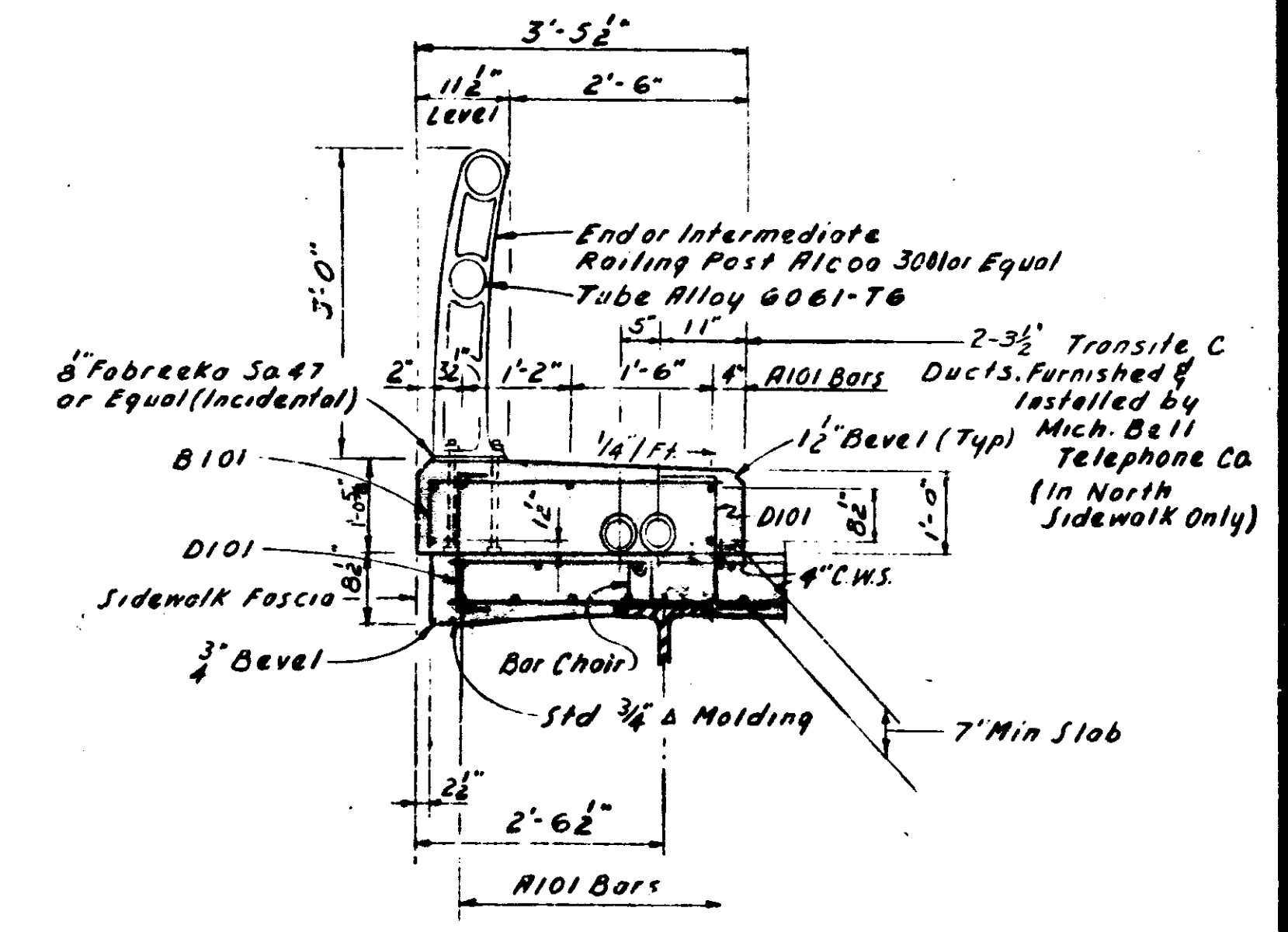
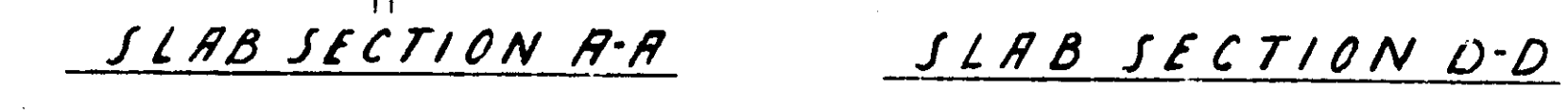
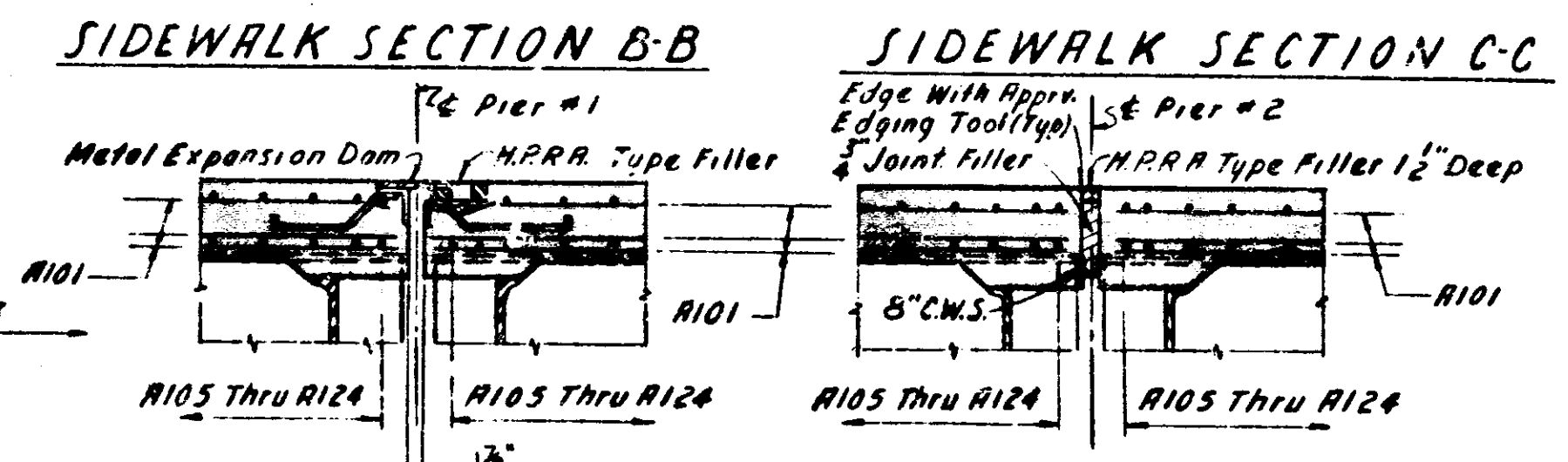
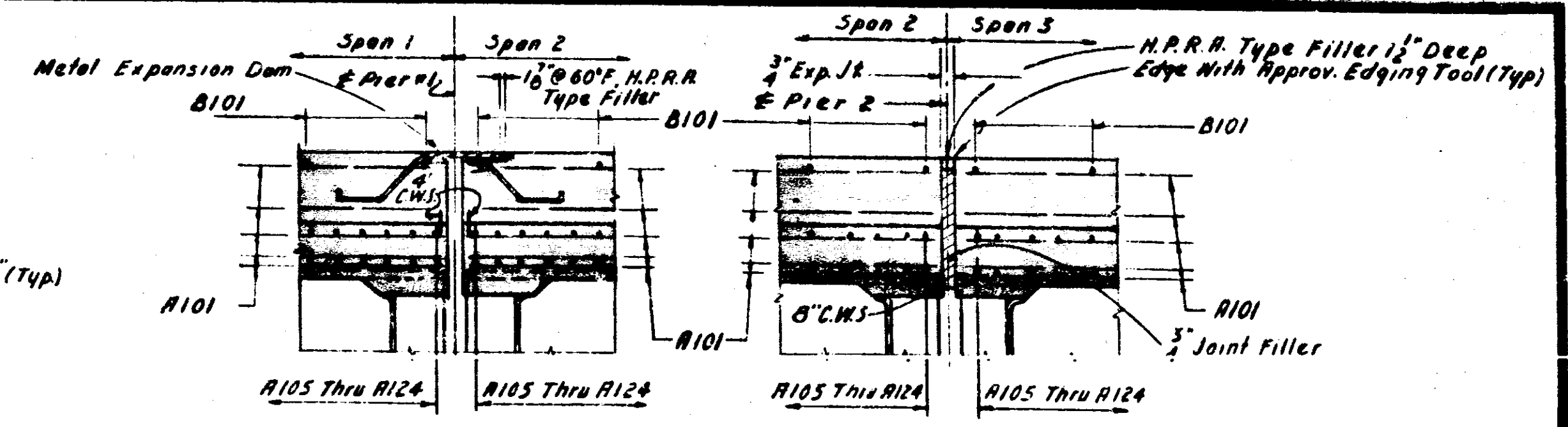
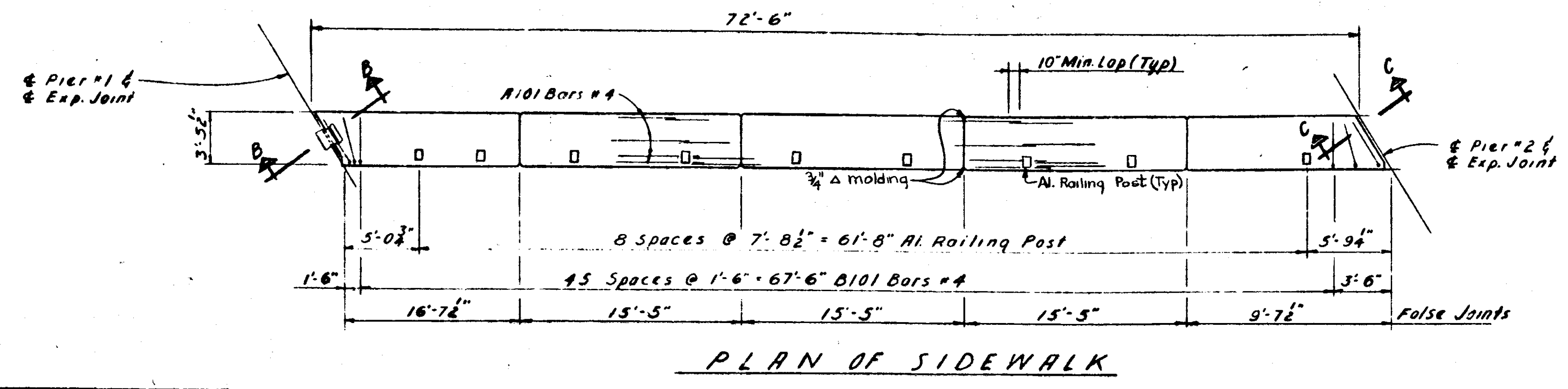
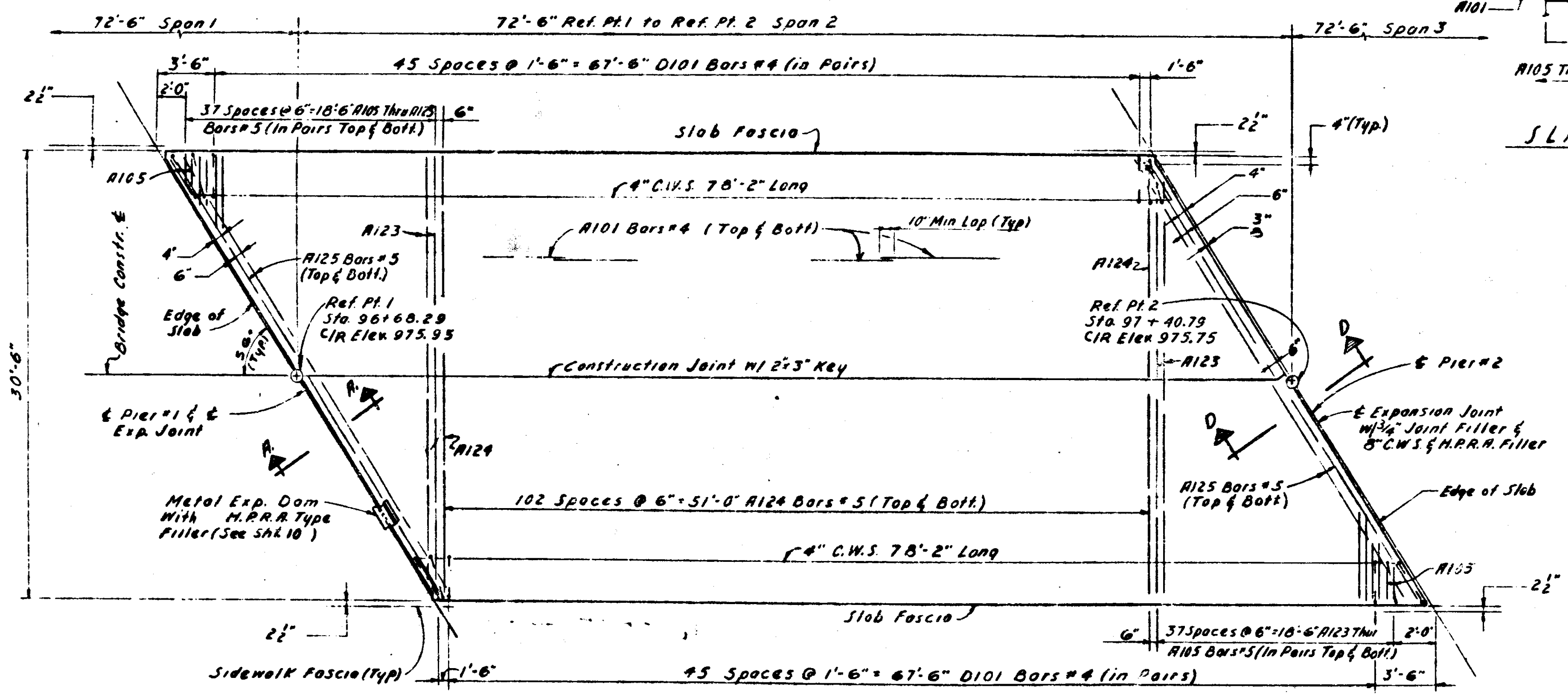
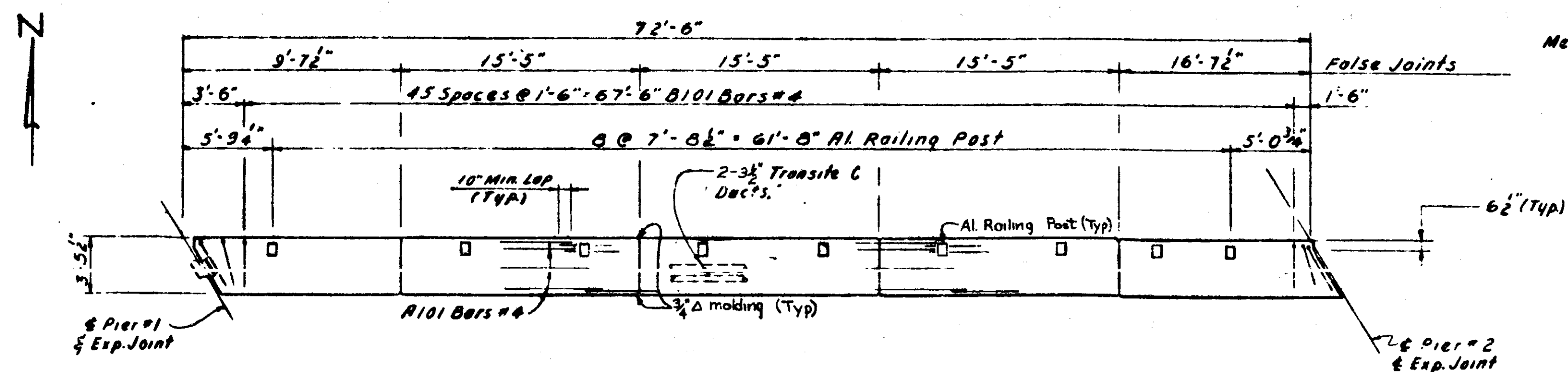
WORK THIS SHEET WITH SHEETS 8, 9 & 10

MICHIGAN STATE HIGHWAY DEPARTMENT  
SUPERSTRUCTURE DETAILS  
SPAN 1

| REVISIONS |             |      |    |
|-----------|-------------|------|----|
| NO.       | DESCRIPTION | DATE | BY |
|           |             |      |    |
|           |             |      |    |
|           |             |      |    |
|           |             |      |    |

|               |          |          |
|---------------|----------|----------|
| SQUAD BOSS    | Rossman  | 11-19-60 |
| DRAWN BY      | Mitchell | 10-60    |
| TRACED BY     |          |          |
| CHECKED BY    | F.O.C.   | 11-17-60 |
| SHEET 7 of 14 |          |          |

**B2 of 16-5-6**



WORK THIS SHEET WITH SHEETS 7, 9 & 10

MICHIGAN STATE HIGHWAY DEPARTMENT  
SUPERSTRUCTURE DETAILS  
SPAN 2

| REVISIONS |             |      |    |
|-----------|-------------|------|----|
| NO.       | DESCRIPTION | DATE | BY |
| 1         |             |      |    |
| 2         |             |      |    |
| 3         |             |      |    |
| 4         |             |      |    |
| 5         |             |      |    |

DESIGNED BY: J. C. Smith 11-19-60  
DRAWN BY: Mitchell 10-60  
CHECKED BY: E. C. Smith 11-17-60  
DATE: 11-17-60  
SHEET: 8 OF 10  
B2 OF 16-5-6

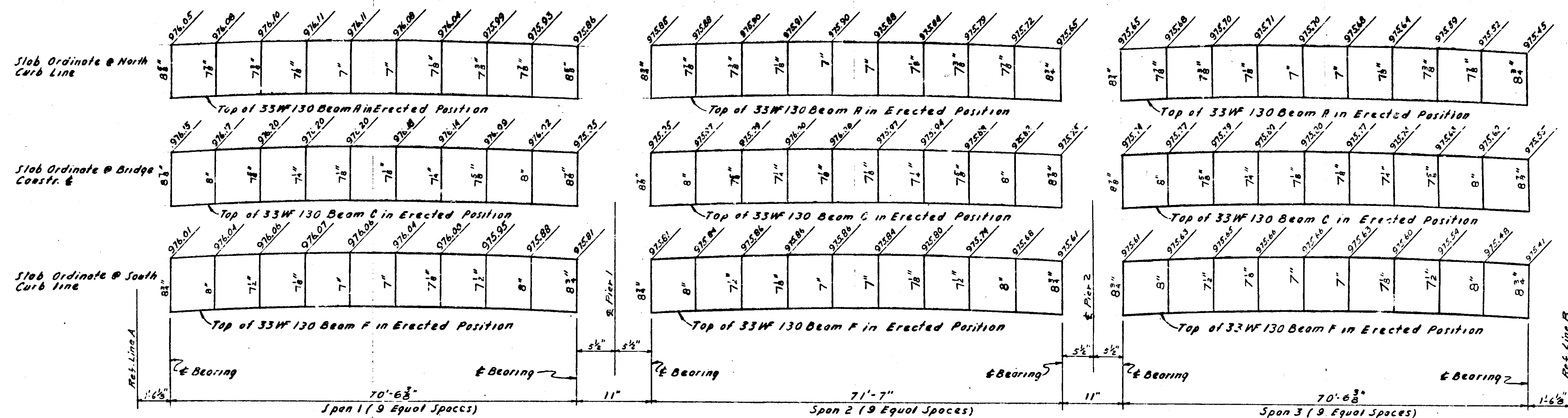




# MICHIGAN STATE HIGHWAY DEPARTMENT

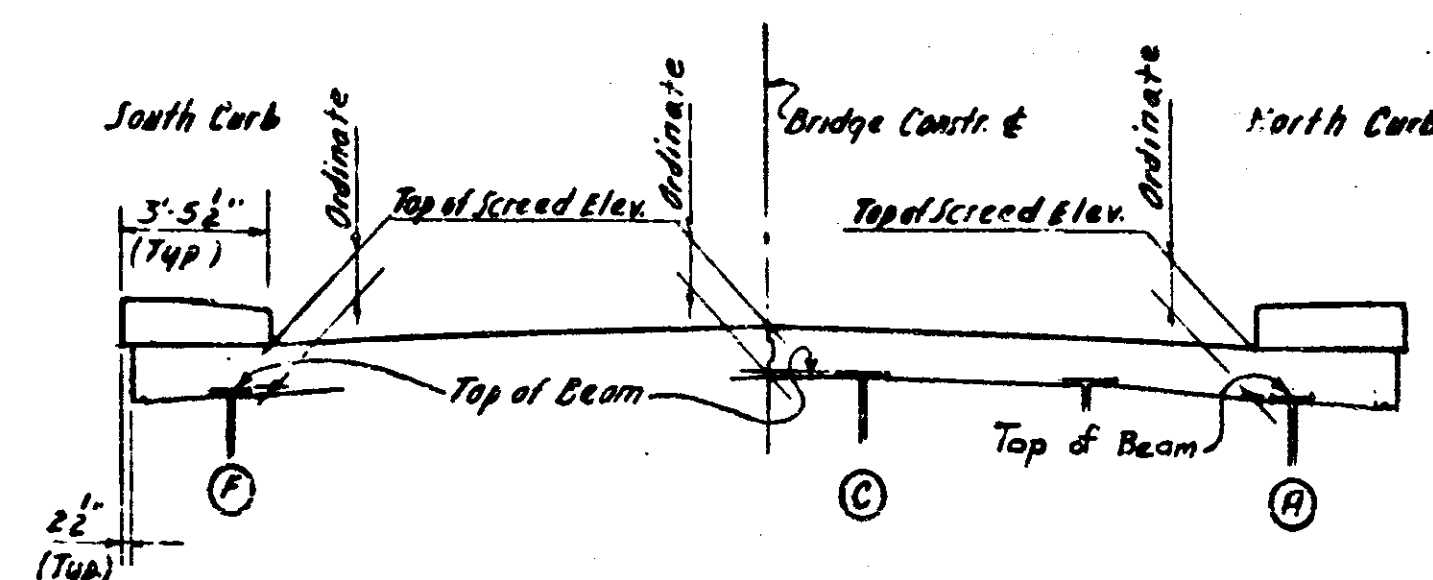
## SUPERSTRUCTURE DETAILS

### SPAN 3



### SLAB ORDINATE DIAGRAM

NOTE: The slab ordinates shown provide for dead load deflection, crown and beam camber, and are to be measured from the top of the screed. Elevations shown are for top of screed before pouring any concrete, and are based on a minimum slab thickness of 7". After screeds are set, if check indicates that less than the minimum thickness will be obtained, adjust screeds and expansion dams accordingly.



SECTION THROUGH DECK SHOWING LOCATION OF SCREED ELEVATIONS

| MISCELLANEOUS QUANTITIES                 |         |        |
|--|---------|--------|
| ITEM                                     | UNIT    | AMOUNT |
| Alum. Br. Rolling-Fab. & Erect. (3 Tube) | Lin Ft. | 435    |
| Hot Poured Rubber Asphalt Type Filler    | Lin Ft. | 74     |
| 3/4" Joint Filler                        | Sq Ft.  | 28     |
| Copper Water Stop                        | Lbs     | 180    |
|  |         |        |
|  |         |        |
|  |         |        |
|  |         |        |
|  |         |        |

| CONCRETE QUANTITIES GRADE #6B |      |      |      |               |
|-------------------------------|------|------|------|---------------|
| LOCATION OF POUR              | SPAN |      |      | TOTAL CU. YDS |
|                               | 1    | 2    | 3    |               |
| North Sidewalk                | 9.3  | 9.8  | 9.3  | 28.4          |
| North Rdwy Slab               | 30.0 | 26.8 | 29.5 | 86.3          |
| South Rdwy Slab               | 29.5 | 26.8 | 30.0 | 86.3          |
| South Sidewalk                | 9.8  | 10.3 | 9.8  | 29.9          |
| <b>GRAND TOTAL</b>            |      |      |      | <b>230.9</b>  |

WORK THIS SHEET WITH SHEETS 7.0 & 9

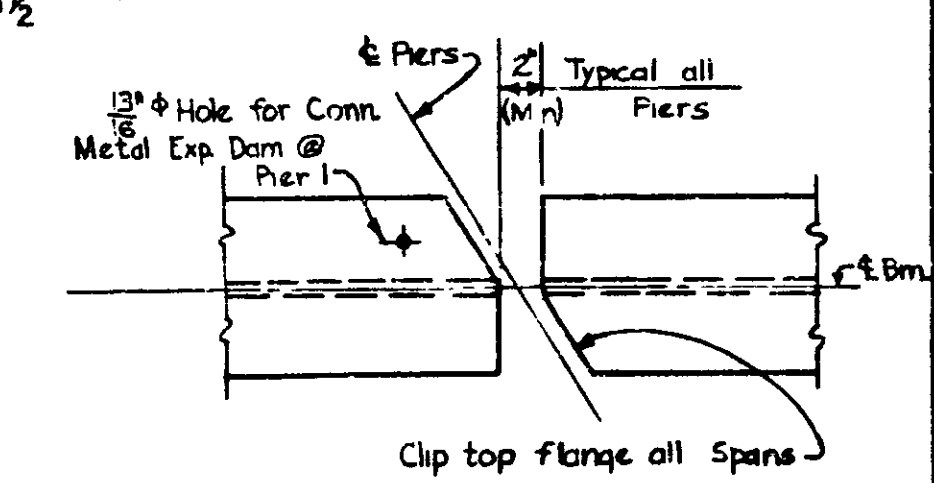
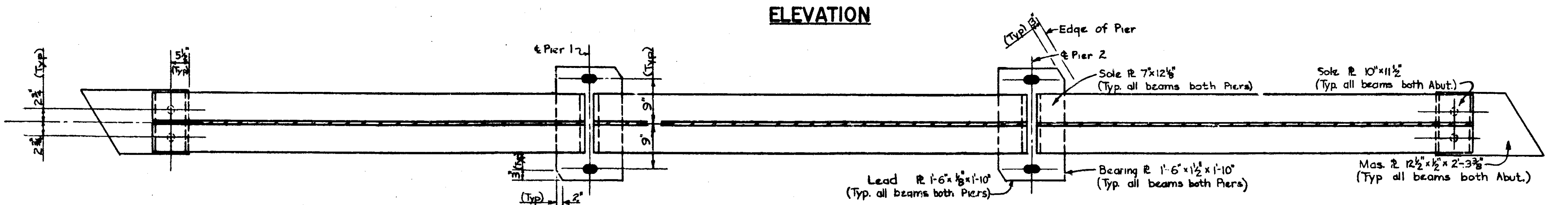
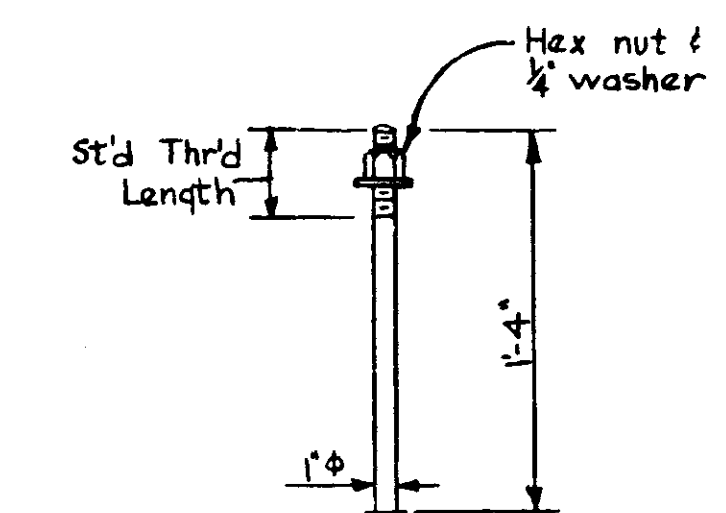
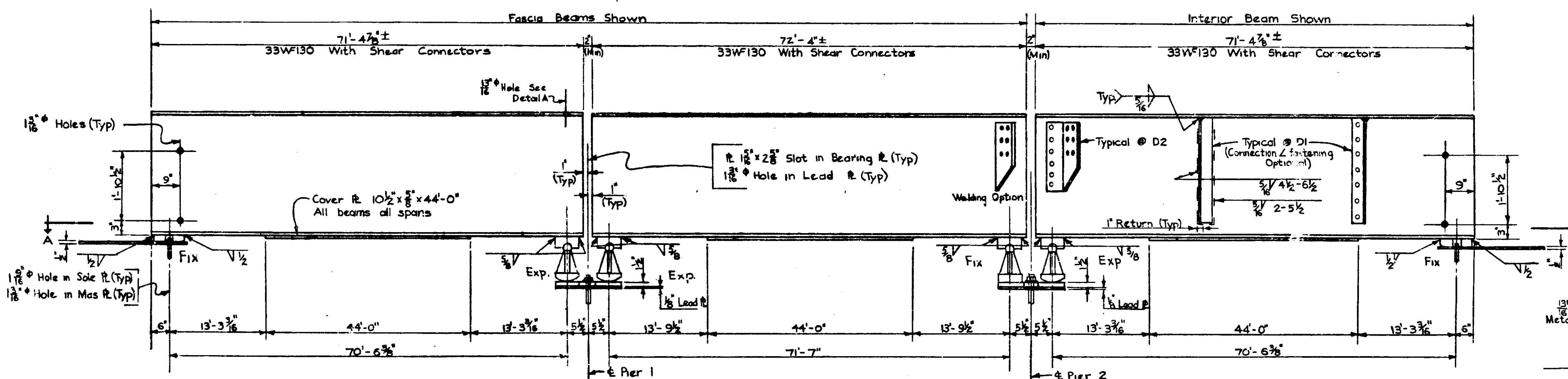
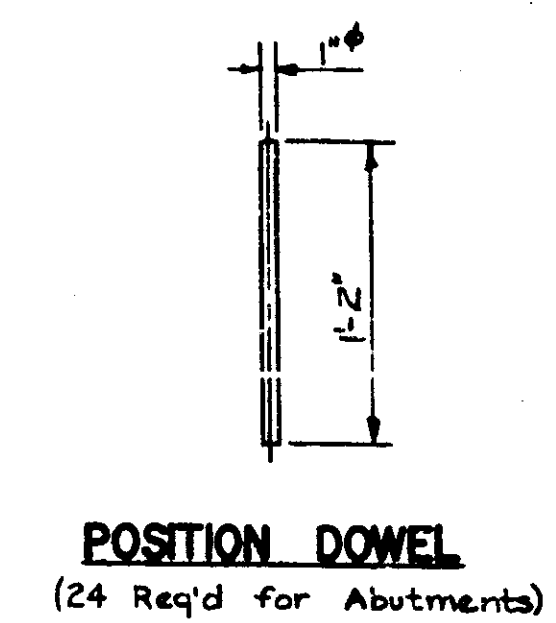
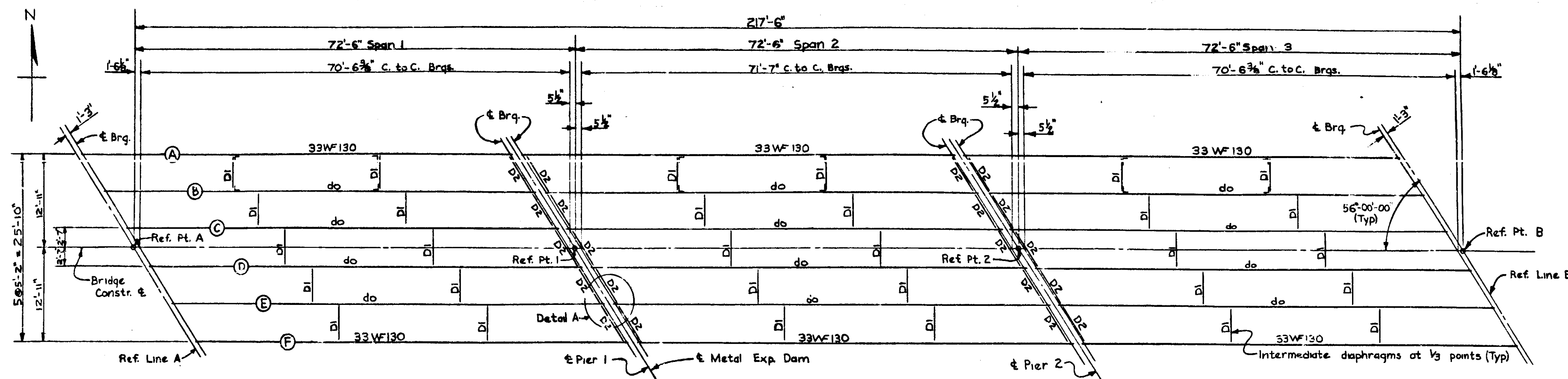
### MICHIGAN STATE HIGHWAY DEPARTMENT SUPERSTRUCTURE DETAILS

| REVISIONS |             |      |    |
|-----------|-------------|------|----|
| NO.       | DESCRIPTION | DATE | BY |
|           |             |      |    |
|           |             |      |    |

|             |                  |
|-------------|------------------|
| DESIGNED BY | Prismen 11-19-60 |
| DRAWN BY    | McNeill 10-60    |
| CHECKED BY  | FOC 11-17-60     |
| DATE        | 10-14            |

B2 of 16-5-5





Note:

See Tab. on Sheet 12 for Sole Pl. Thickness.

Work this sheet with sheets 12 & 13

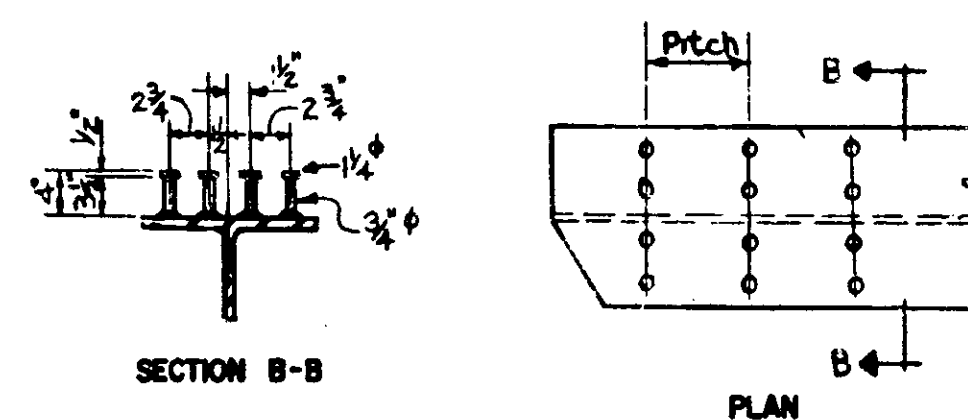
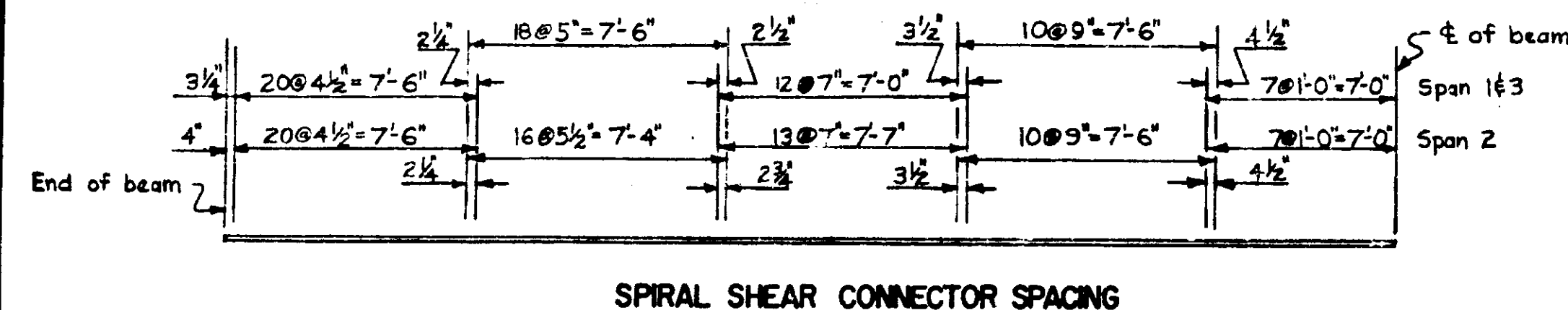
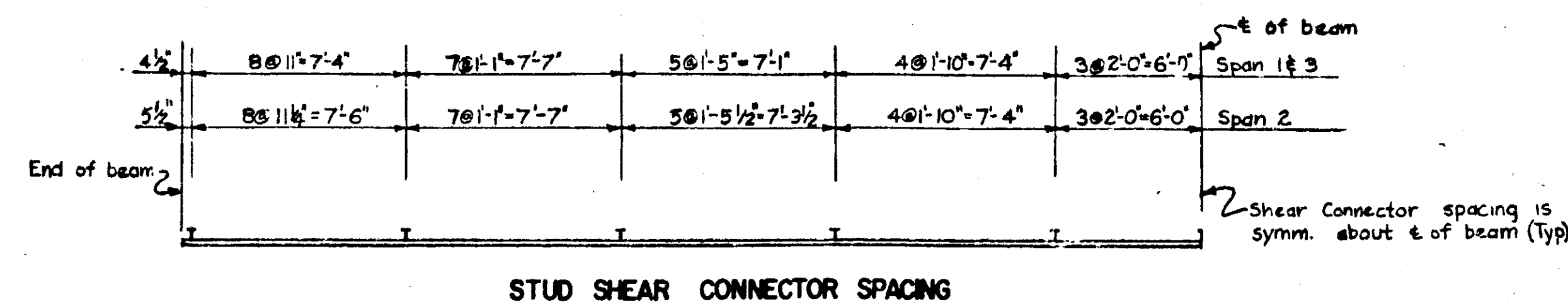
MICHIGAN STATE HIGHWAY DEPARTMENT

STRUCTURAL STEEL DETAILS

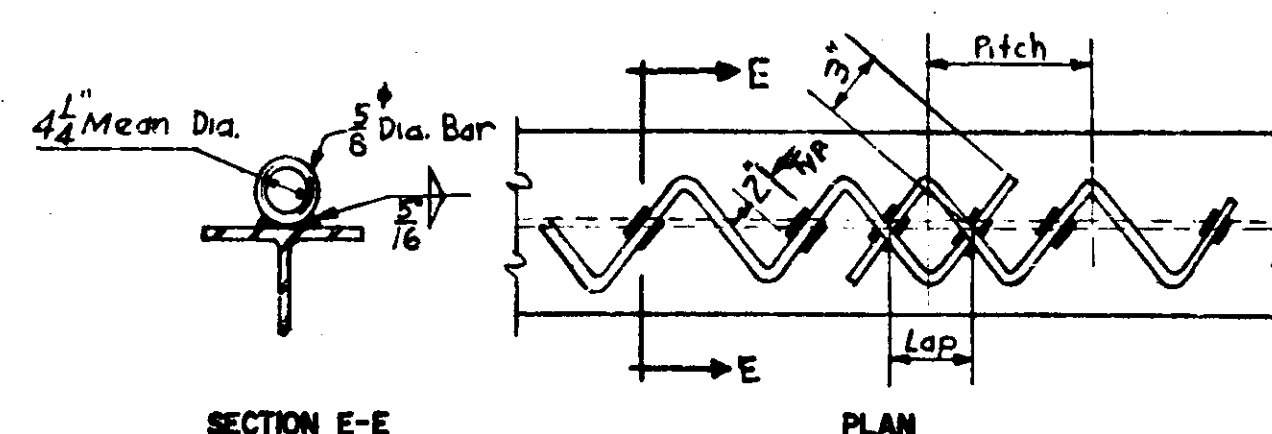
| REVISIONS |             |      |    |
|-----------|-------------|------|----|
| NO.       | DESCRIPTION | DATE | BY |
|           |             |      |    |
|           |             |      |    |

|             |                  |
|-------------|------------------|
| DESIGNED BY | RUSSELL 11-19-60 |
| DRAWN BY    | F.O.C. 10-21-60  |
| CHECKED BY  | F.O.W. 11-4-60   |
| SHEET       | 11 OF 14         |

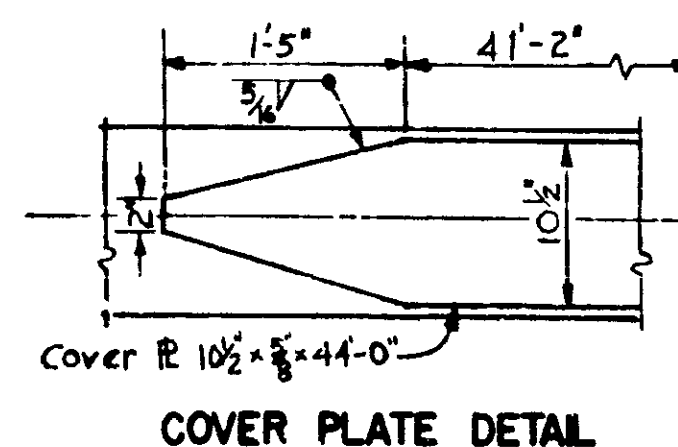
B2 OF 16-5-6



STUD SHEAR CONNECTOR DETAILS

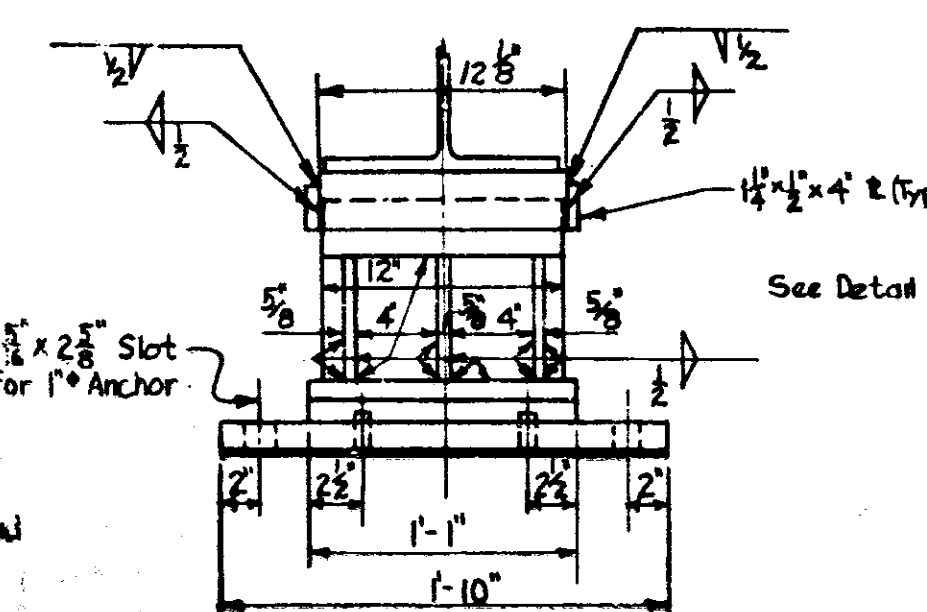
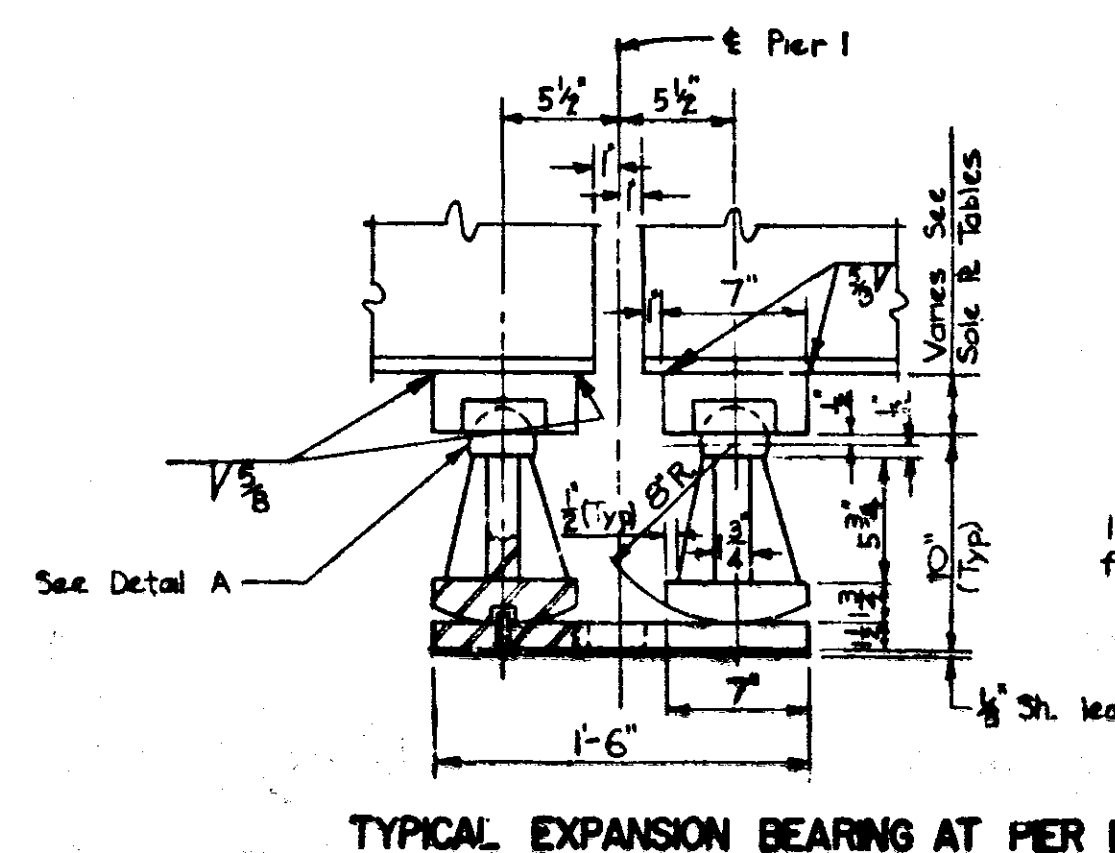


SPIRAL SHEAR CONNECTOR DETAILS

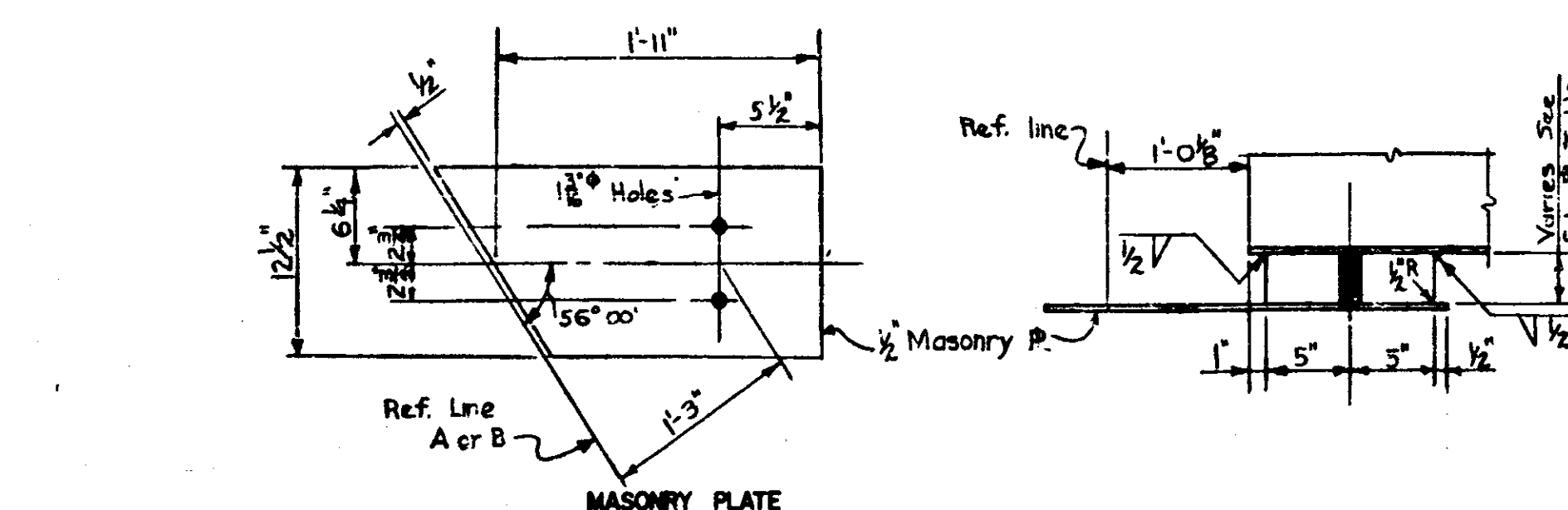


| Span   | Wt. Req'd. |
|--------|------------|
| 1      | 1320       |
| 2      | 1320       |
| 3      | 1320       |
| Totals | 3960       |

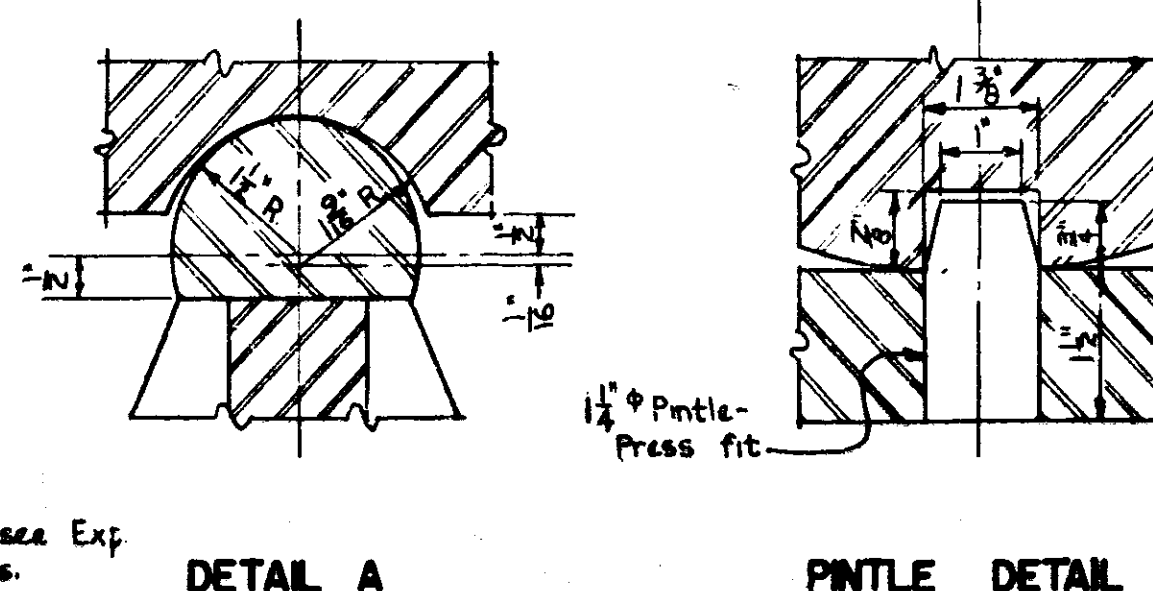
| Span  | Weight (lb.) |
|-------|--------------|
| 1     | 1140.0       |
| 2     | 1132.0       |
| 3     | 1140.0       |
| Total | 3412.0       |



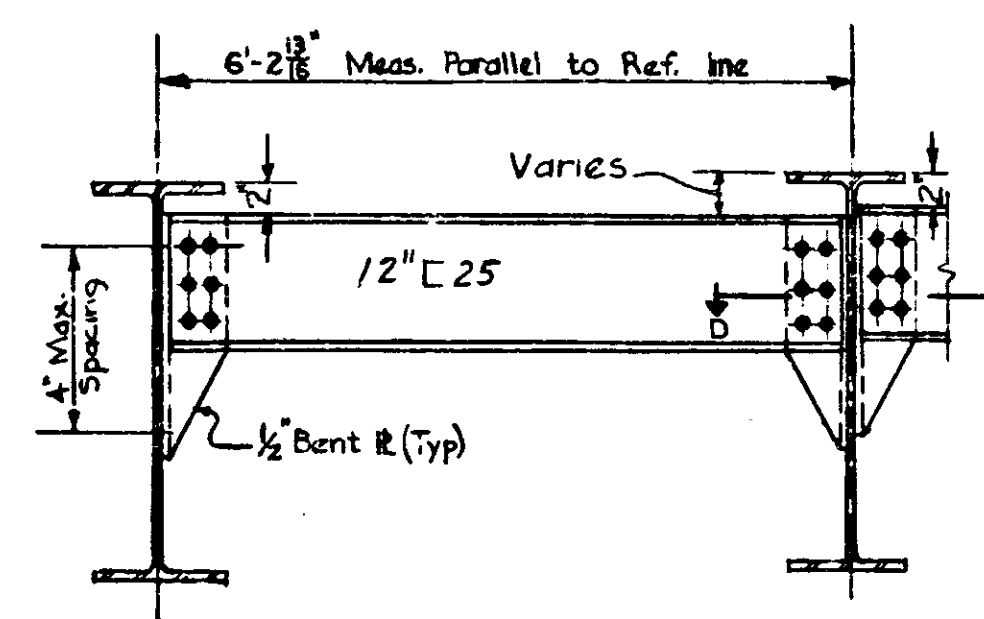
TYPICAL EXPANSION & FIXED BEARING AT PIER 2



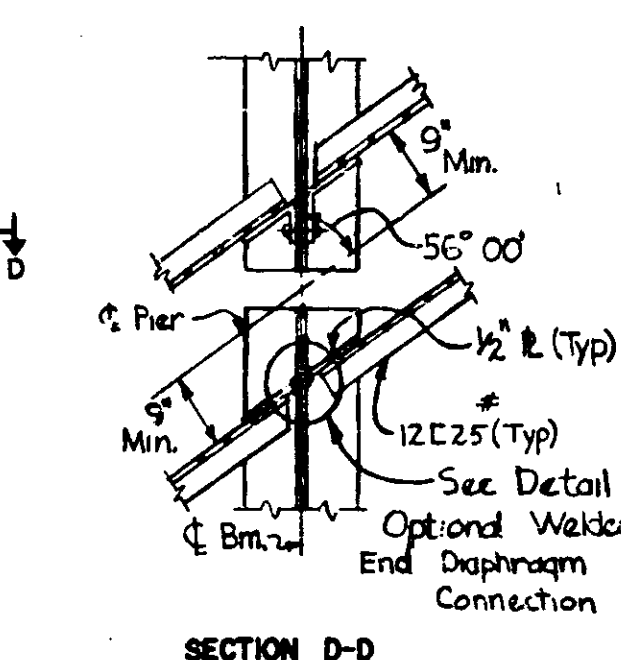
TYPICAL BEARING AT ABUTMENTS



TYPICAL INTERMEDIATE DIAPHRAGM (D1)  
(30 Req'd)



TYPICAL END DIAPHRAGM (D2)  
(20 Req'd)



SECTION D-D

| BEAM | Span #1 | Span #2 | Span #3 | Span #4 | Span #5 | Span #6 |
|------|---------|---------|---------|---------|---------|---------|
| A    | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   |
| B    | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   |
| C    | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   |
| D    | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   | 3 1/2   |
| E    | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   | 2 1/2   |
| F    | 2       | 2       | 2       | 2       | 2       | 2       |

Notes:

Field Connections: Field connections unless otherwise noted shall be bolted with high strength bolts.

Fabrication: Michigan State Highway Department's Standard Specifications for Road & Bridge Construction-1960 Edition.

Design: Michigan State Highway Department's Specifications for the design of Highway Bridges 1958 Edition (H15-44 Loading).

Shop Connections: All shop connections shall be welded or riveted as shown on the plans.

Rivets or High-Strength Bolts: 3/4" Dia.

Open Holes: Open holes for rivets or high-strength bolts shall be 1 1/4" Dia. unless otherwise noted.

Shop Paint: In addition to the shop paint provisions of the Standard Specifications, the top surfaces of masonry plates shall be coated in accordance with requirements for machine finished surfaces.

Metal expansion dam shall not be painted in the shop except as noted on plans.

Camber: Beams in span 1, 2 & 3 shall be given a camber of 3/8" (maximum ordinate) in the mill.

Sole plates: Sole plates 3' or more in thickness may be built up by welding together plates not less than 1/2" in thickness. Edges must be beveled 1/4" and welded, with a continuous weld, for the full perimeter. Welds shall be ground flush with faces of plate.

Field Paint: Field painting shall consist of one complete coat of painting Mixture 2A & one complete coat of painting Mixture 5B.

All beams & cover plates in spans 1, 2 & 3 shall conform to the requirement for welding (A.S.T.M. A-373). All other steel shall be A-7.

The Quantity Structural Steel-Fabrication and Erection Include:

A7 Steel 23,380 lbs

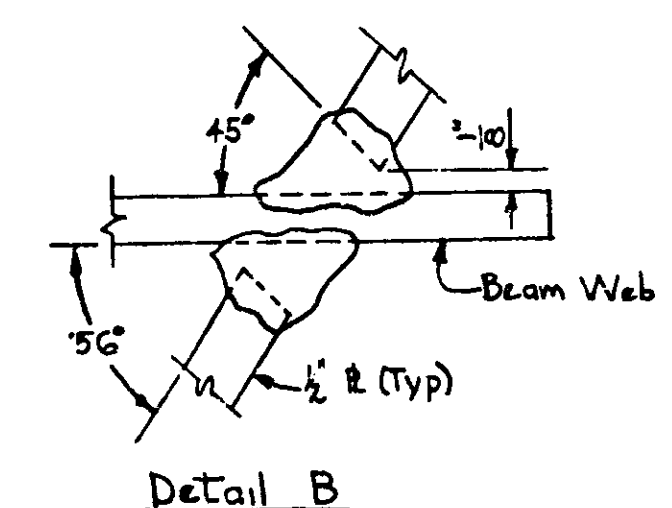
A373 Steel 185,486 lbs

Lead Plates 234 lbs

Total 209,100 lbs Structural Steel-Fab & Erection.

Field painting Lump Sum

Shear Connectors Lump Sum



Work This sheet with Sheets 11 & 13

MICHIGAN STATE HIGHWAY DEPARTMENT

STRUCTURAL STEEL DETAILS

| NO. | REVISIONS   | DATE | BY |
|-----|-------------|------|----|
| 1   | DESCRIPTION |      |    |
| 2   |             |      |    |
| 3   |             |      |    |
| 4   |             |      |    |
| 5   |             |      |    |

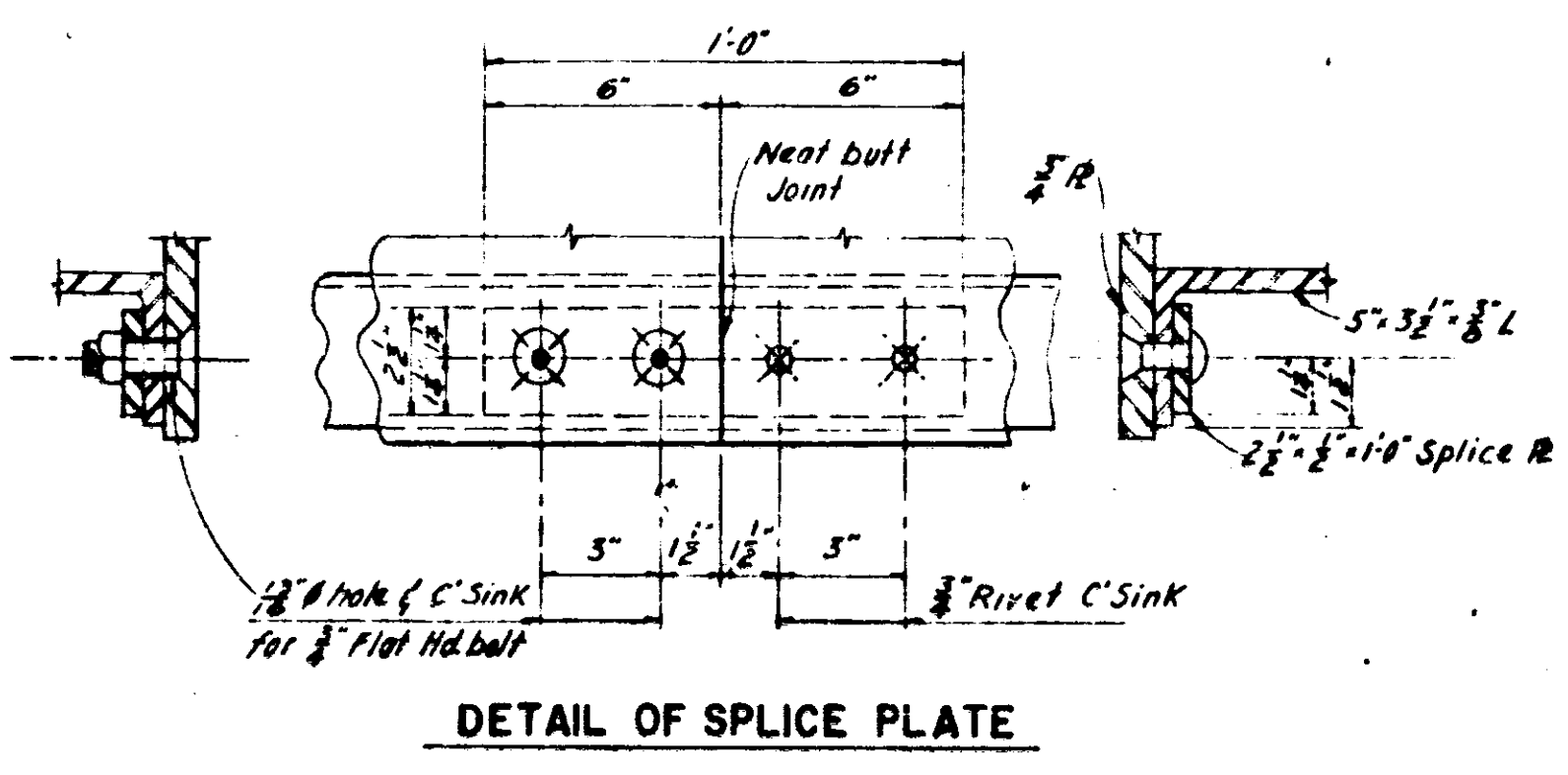
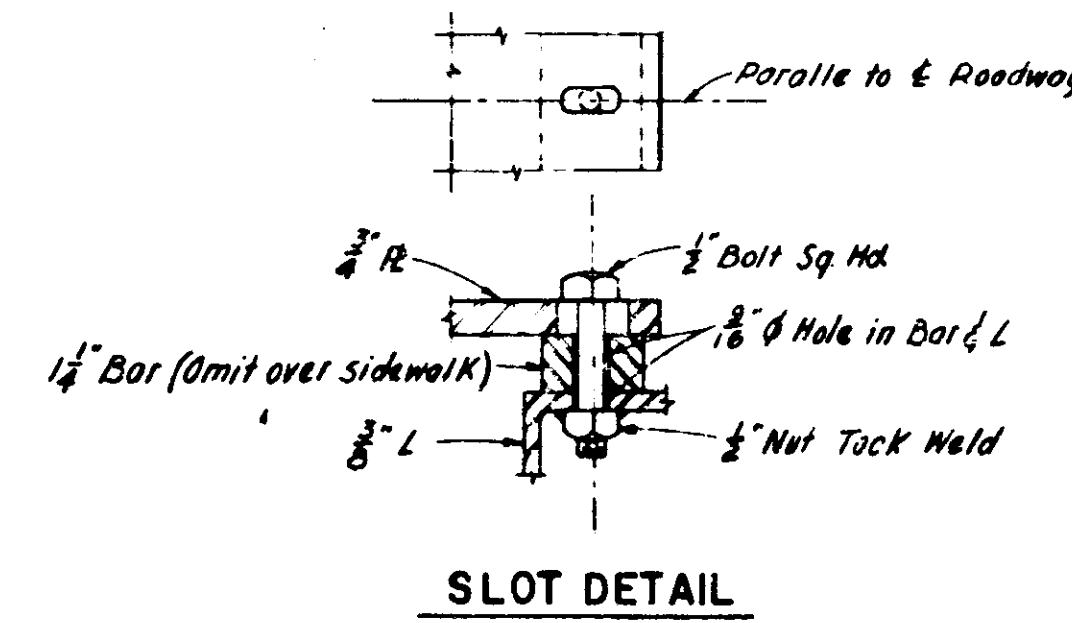
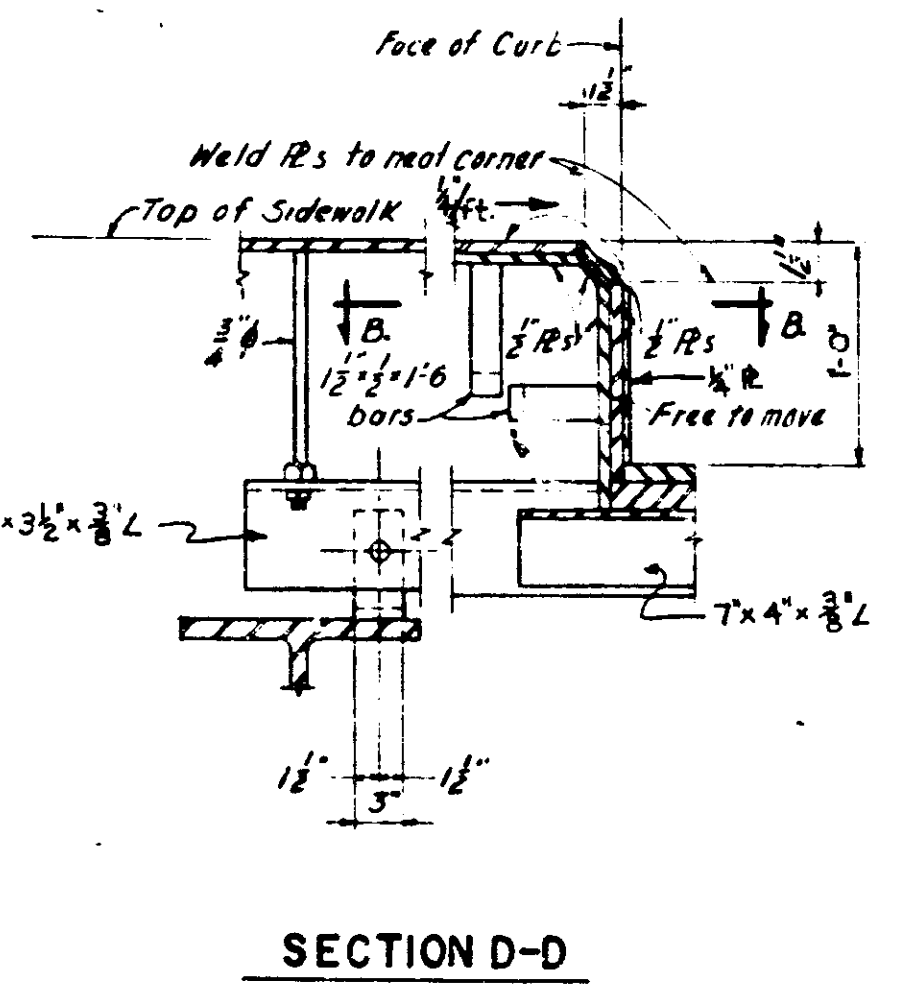
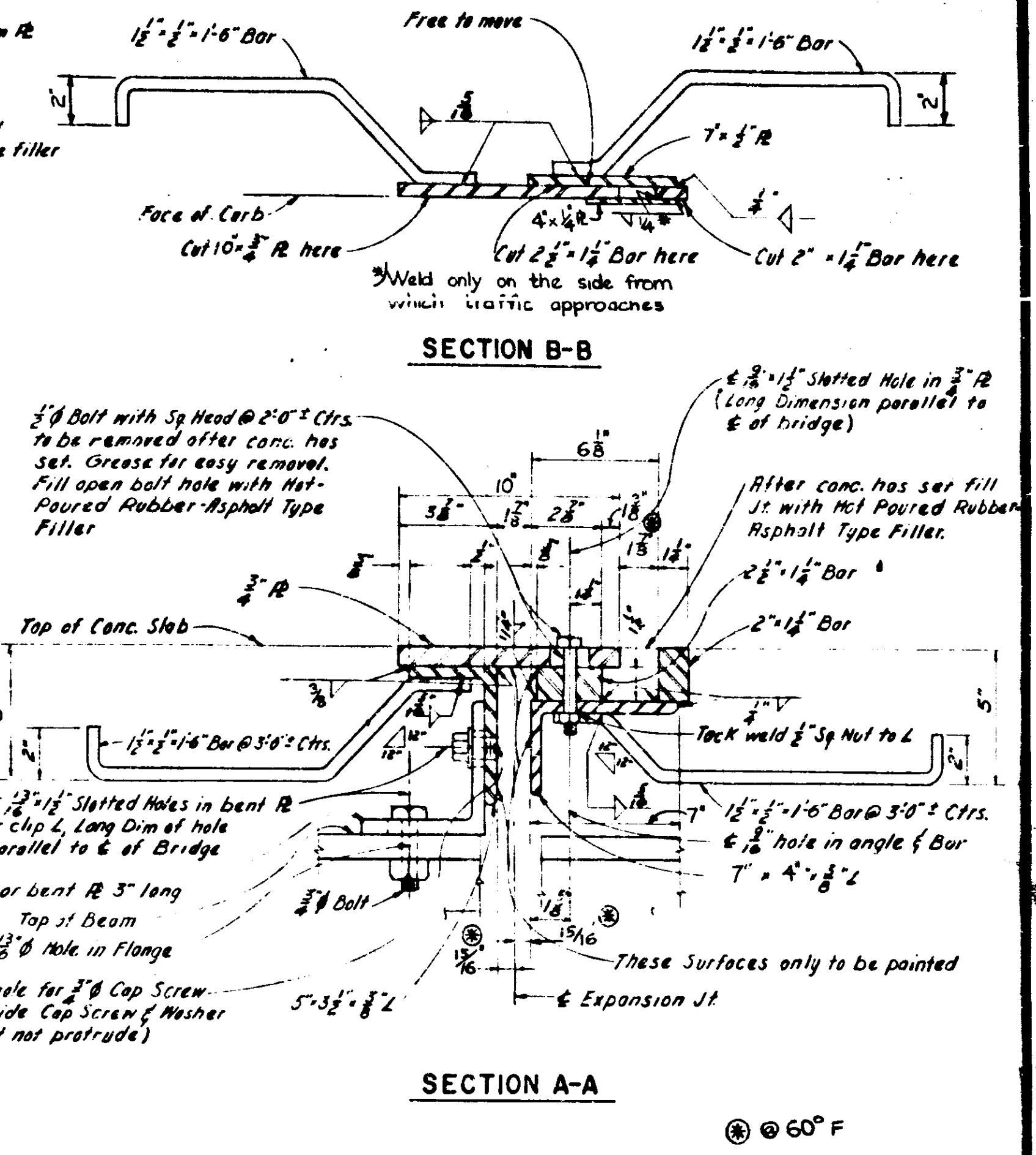
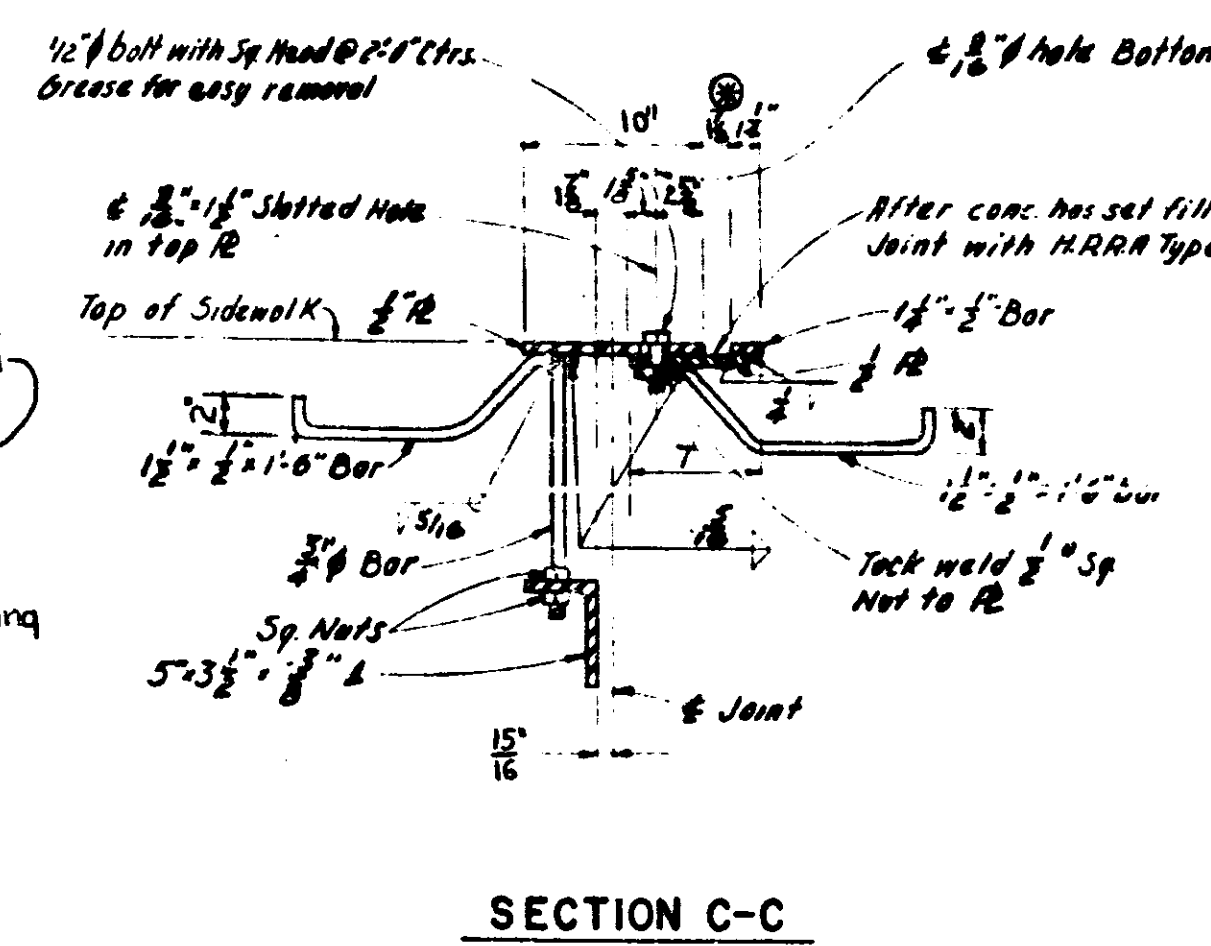
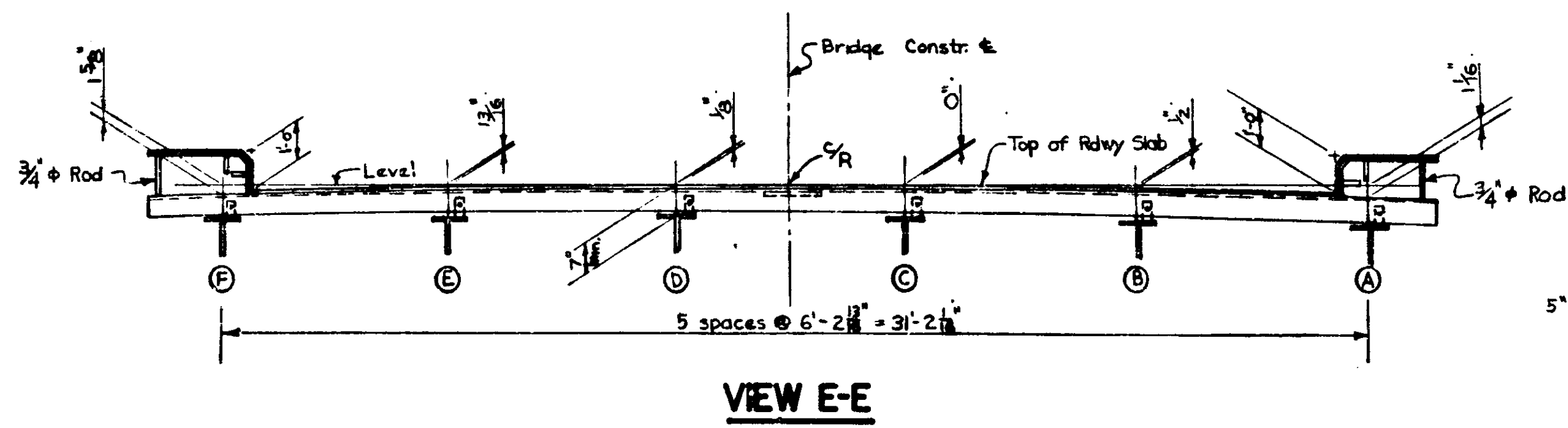
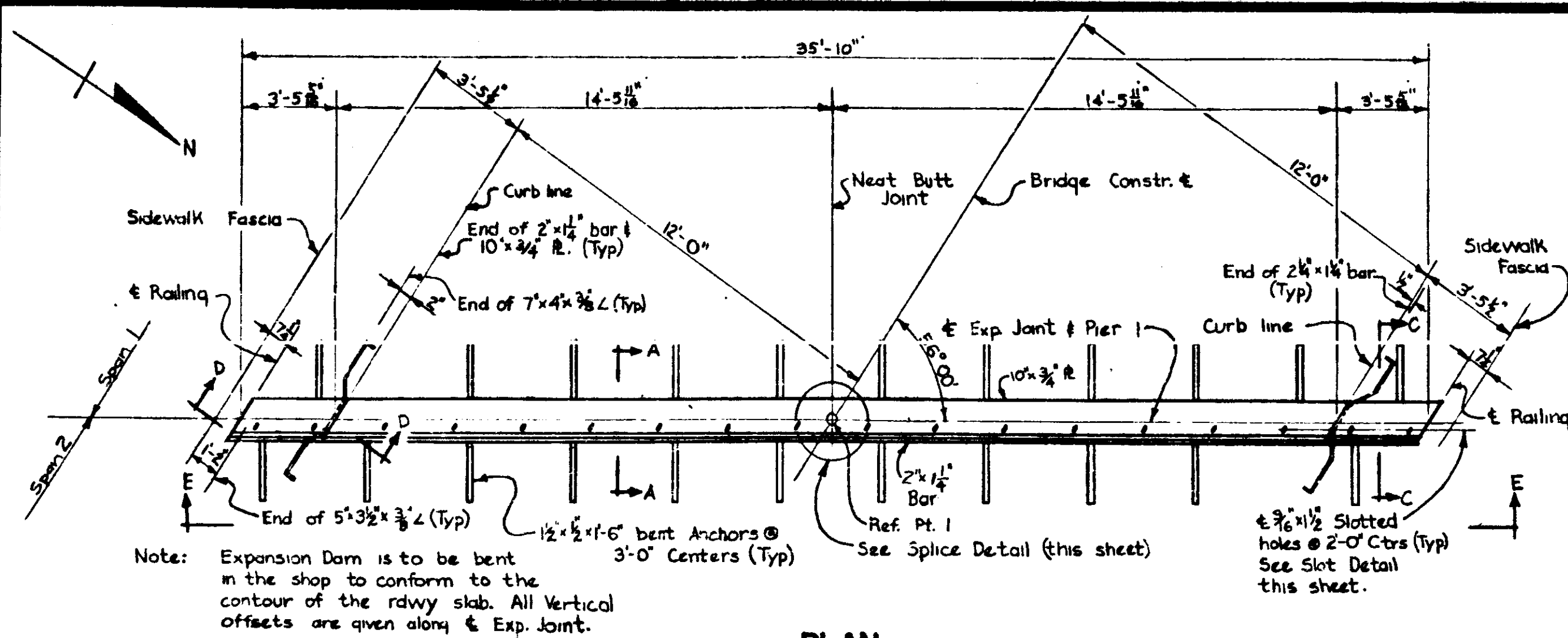
DESIGNED BY: F.O.C. 10-20-60

CHECKED BY: F.O.C. 10-20-60

SHEET 12 OF 14

B2 OF 16-5-6





Work This Sheet With Sheets No. 11 & 12.

Note: Total weight of Expansion Dam=2148lbs (Included in weight of structural steel- Fabrication & Erection- Sht.)

| MICHIGAN STATE HIGHWAY DEPARTMENT |             |      |    |
|-----------------------------------|-------------|------|----|
| EXPANSION DAM DETAILS             |             |      |    |
| REVISIONS                         |             |      |    |
| NO.                               | DESCRIPTION | DATE | BY |
|                                   |             |      |    |
|                                   |             |      |    |
|                                   |             |      |    |
|                                   |             |      |    |

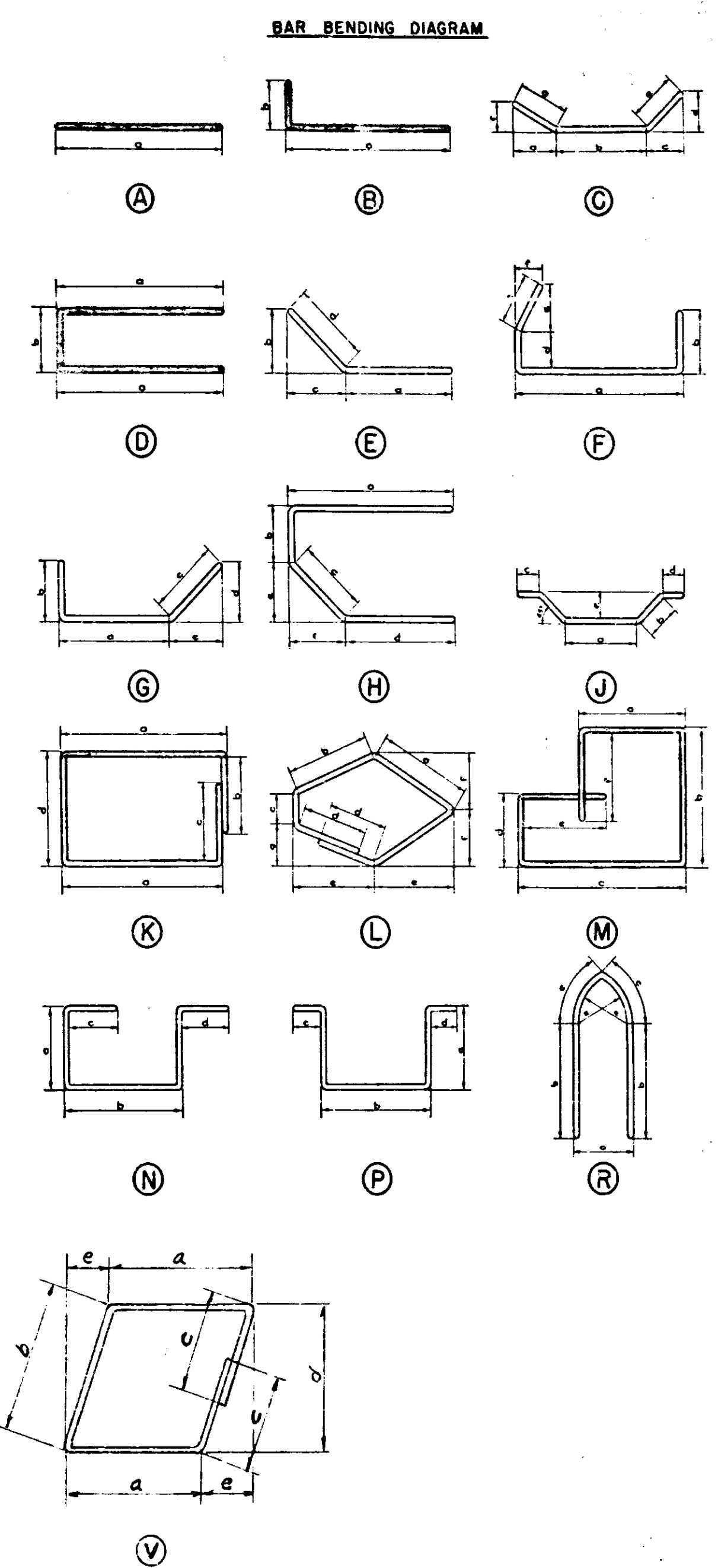
|             |                   |
|-------------|-------------------|
| DESIGNED BY | Auto-man 10-9-60  |
| DRAWN BY    | F.D.L. 10-24-60   |
| CHECKED BY  | ANTCHELL 11-19-60 |
|             |                   |

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| BAR                        | DIMENSIONS |      |   |   |   |   |   | SIZE | LENGTH | NO. REQ'D | TOTAL WT. |
|----------------------------|------------|------|---|---|---|---|---|------|--------|-----------|-----------|
|                            | a          | b    | c | d | e | f | g |      |        |           |           |
| A1                         | 4'3"       |      |   |   |   |   |   | 6    | 4'3"   | 90        | 574       |
| A2                         | 7'0"       |      |   |   |   |   |   | 6    | 7'0"   | 90        | 946       |
| A3                         | 34'0"      |      |   |   |   |   |   | 6    | 34'0"  | 20        | 1021      |
| A4                         | 33'0"      |      |   |   |   |   |   | 6    | 33'0"  | 20        | 991       |
| A5                         | 8'3"       |      |   |   |   |   |   | 6    | 8'3"   | 180       | 2230      |
| A6                         | 34'0"      |      |   |   |   |   |   | 4    | 34'0"  | 20        | 454       |
| A7                         | 33'0"      |      |   |   |   |   |   | 4    | 33'0"  | 20        | 441       |
| A8                         | 5'3"       |      |   |   |   |   |   | 4    | 5'3"   | 4         | 14        |
| A9                         | 11'6"      |      |   |   |   |   |   | 4    | 11'6"  | 8         | 61        |
| A10                        | 9'0"       |      |   |   |   |   |   | 4    | 9'0"   | 8         | 48        |
| A11                        | 5'6"       |      |   |   |   |   |   | 4    | 5'6"   | 8         | 29        |
|                            |            |      |   |   |   |   |   |      |        |           |           |
| D1                         | 2'3 1/2"   | 1'0" |   |   |   |   |   | 4    | 5'6"   | 12        | 44        |
| D2                         | 3'2 1/2"   | 1'0" |   |   |   |   |   | 4    | 8'6"   | 12        | 68        |
| D3                         | 5'6 1/2"   | 1'0" |   |   |   |   |   | 4    | 12'0"  | 18        | 144       |
| Total Weight For Abutments |            |      |   |   |   |   |   |      |        |           | 70650     |

| BAR                    | DIMENSIONS |          |          |          |          |   |   | SIZE | LENGTH | NO. REQ'D | TOTAL WT. |
|------------------------|------------|----------|----------|----------|----------|---|---|------|--------|-----------|-----------|
|                        | a          | b        | c        | d        | e        | f | g |      |        |           |           |
| A51                    | 40'0"      |          |          |          |          |   |   | 7    | 40'0"  | 16        | 1308      |
| A52                    | 40'0"      |          |          |          |          |   |   | 9    | 40'0"  | 16        | 2176      |
| A53                    | 8'6"       |          |          |          |          |   |   | 6    | 8'6"   | 74        | 945       |
| A54                    | 8'6"       |          |          |          |          |   |   | 6    | 8'6"   | 58        | 741       |
| A55                    | 21'9"      |          |          |          |          |   |   | 9    | 21'9"  | 18        | 1331      |
| A56                    | 33'6"      |          |          |          |          |   |   | 6    | 33'6"  | 4         | 201       |
| A57                    | 33'6"      |          |          |          |          |   |   | 8    | 33'6"  | 12        | 1073      |
| A58                    | 26'0"      |          |          |          |          |   |   | 10   | 26'0"  | 12        | 1343      |
| A59                    | 9'6"       |          |          |          |          |   |   | 6    | 9'6"   | 16        | 228       |
| A60                    | 5'0"       |          |          |          |          |   |   | 9    | 5'0"   | 48        | 816       |
| A61                    | 20'9"      |          |          |          |          |   |   | 9    | 20'9"  | 18        | 1270      |
|                        |            |          |          |          |          |   |   |      |        |           |           |
| E51                    | 21'9"      | 7'0"     |          |          |          |   |   | 9    | 28'9"  | 6         | 587       |
| E52                    | 20'9"      | 7'0"     |          |          |          |   |   | 9    | 27'9"  | 6         | 566       |
|                        |            |          |          |          |          |   |   |      |        |           |           |
| K51                    | 2'0"       | 1'5"     | 1'5"     | 2'0"     |          |   |   | 4    | 8'0"   | 20        | 117       |
| K52                    | 1'6"       | 1'2"     | 1'2"     | 1'6"     |          |   |   | 4    | 6'0"   | 19        | 86        |
| K53                    | 2'6"       | 1'5"     | 1'5"     | 2'0"     |          |   |   | 4    | 9'0"   | 40        | 260       |
| K54                    | 2'6"       | 1'5"     | 1'5"     | 2'0"     |          |   |   | 4    | 9'0"   | 52        | 339       |
|                        |            |          |          |          |          |   |   |      |        |           |           |
| V51                    | 1'8 1/2"   | 1'8 1/2" | 1'3 1/4" | 1'7 3/4" | 0'5 1/2" |   |   | 4    | 7'6"   | 38        | 190       |
| Total Weight For Piers |            |          |          |          |          |   |   |      |        |           | 13,577    |

| BAR                             | DIMENSIONS |          |      |          |      |      |   | SIZE | LENGTH | NO. REQ'D | TOTAL WT. |
|---------------------------------|------------|----------|------|----------|------|------|---|------|--------|-----------|-----------|
|                                 | a          | b        | c    | d        | e    | f    | g |      |        |           |           |
| A101                            | 24'4"      |          |      |          |      |      |   | 4    | 24'4"  | 814       | 13538     |
| A102                            | 36'0"      |          |      |          |      |      |   | 4    | 36'0"  | 20        | 481       |
| A103                            | 1'9"       |          |      |          |      |      |   | 4    | 1'9"   | 12        | 11        |
| A104                            | 3'0"       |          |      |          |      |      |   | 4    | 3'0"   | 12        | 24        |
| A105                            | 2'3"       |          |      |          |      |      |   | 5    | 2'3"   | 24        | 56        |
| A106                            | 3'9"       |          |      |          |      |      |   | 5    | 3'9"   | 24        | 94        |
| A107                            | 5'3"       |          |      |          |      |      |   | 5    | 5'3"   | 24        | 132       |
| A108                            | 6'9"       |          |      |          |      |      |   | 5    | 6'9"   | 24        | 169       |
| A109                            | 8'3"       |          |      |          |      |      |   | 5    | 8'3"   | 24        | 206       |
| A110                            | 9'9"       |          |      |          |      |      |   | 5    | 9'9"   | 24        | 244       |
| A111                            | 11'3"      |          |      |          |      |      |   | 5    | 11'3"  | 24        | 282       |
| A112                            | 12'9"      |          |      |          |      |      |   | 5    | 12'9"  | 24        | 319       |
| A113                            | 14'3"      |          |      |          |      |      |   | 5    | 14'3"  | 24        | 357       |
| A114                            | 15'6"      |          |      |          |      |      |   | 5    | 15'6"  | 24        | 388       |
| A115                            | 17'3"      |          |      |          |      |      |   | 5    | 17'3"  | 24        | 432       |
| A116                            | 18'6"      |          |      |          |      |      |   | 5    | 18'6"  | 24        | 463       |
| A117                            | 20'0"      |          |      |          |      |      |   | 5    | 20'0"  | 24        | 501       |
| A118                            | 21'9"      |          |      |          |      |      |   | 5    | 21'9"  | 24        | 545       |
| A119                            | 23'0"      |          |      |          |      |      |   | 5    | 23'0"  | 24        | 576       |
| A120                            | 24'6"      |          |      |          |      |      |   | 5    | 24'6"  | 24        | 613       |
| A121                            | 26'0"      |          |      |          |      |      |   | 5    | 26'0"  | 20        | 542       |
| A122                            | 27'6"      |          |      |          |      |      |   | 5    | 27'6"  | 24        | 688       |
| A123                            | 29'0"      |          |      |          |      |      |   | 5    | 29'0"  | 24        | 726       |
| A124                            | 30'0"      |          |      |          |      |      |   | 5    | 30'0"  | 24        | 764       |
| A125                            | 36'3"      |          |      |          |      |      |   | 5    | 36'3"  | 16        | 605       |
|                                 |            |          |      |          |      |      |   |      |        |           |           |
| B101                            | 3'0 1/2"   | 9"       |      |          |      |      |   | 4    | 3'9"   | 800       | 753       |
| D101                            | 6'1/2"     | 1'6"     |      |          |      |      |   | 4    | 2'6"   | 600       | 1002      |
| K101                            | 3'2"       | 11 1/2"  | 11"  | 1'3 1/2" |      |      |   | 4    | 6'3"   | 8         | 33        |
| M101                            | 2'2"       | 1'3 1/2" | 3'2" | 10"      | 1'7" | 1'1" |   | 4    | 10'0"  | 40        | 267       |
| Total Weight For Superstructure |            |          |      |          |      |      |   |      |        |           | 43387     |



Note:—  
All right angle bends in  
Reinforcing Steel to be made  
about a pin of the minimum  
diameter allowed by the Standard  
Specifications.

Grand Total Steel Reinforcement 64,029 \*

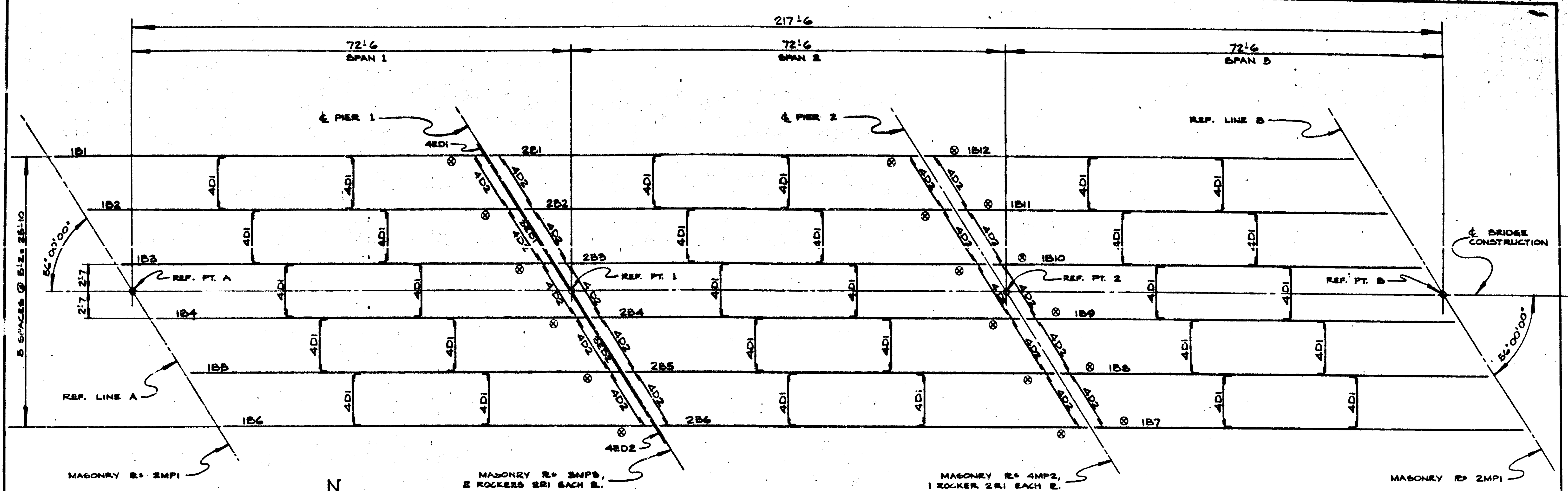
MICHIGAN STATE HIGHWAY DEPARTMENT

STEEL REINFORCEMENT DETAILS

| NO. | REVISIONS | DATE | BY |
|-----|-----------|------|----|
|     |           |      |    |
|     |           |      |    |
|     |           |      |    |

DESIGNED BY: Russman, H-15-60  
DRAWN BY: E.O.H. 11-16-60  
CHECKED BY: F.O.C. 11-17-60  
SHEET 14 OF 14  
B2 OF 16-5-6



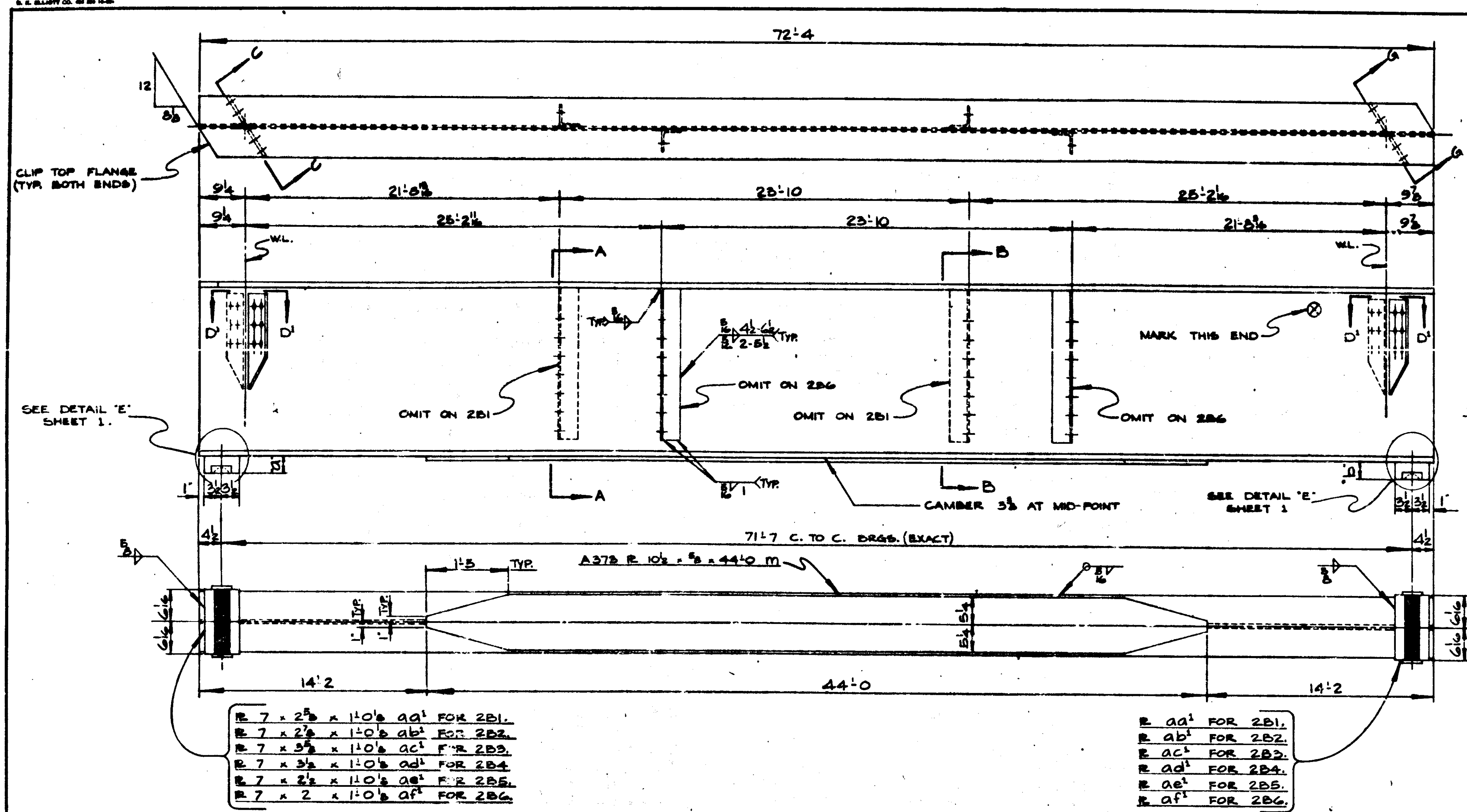


ERECTION DIAGRAM

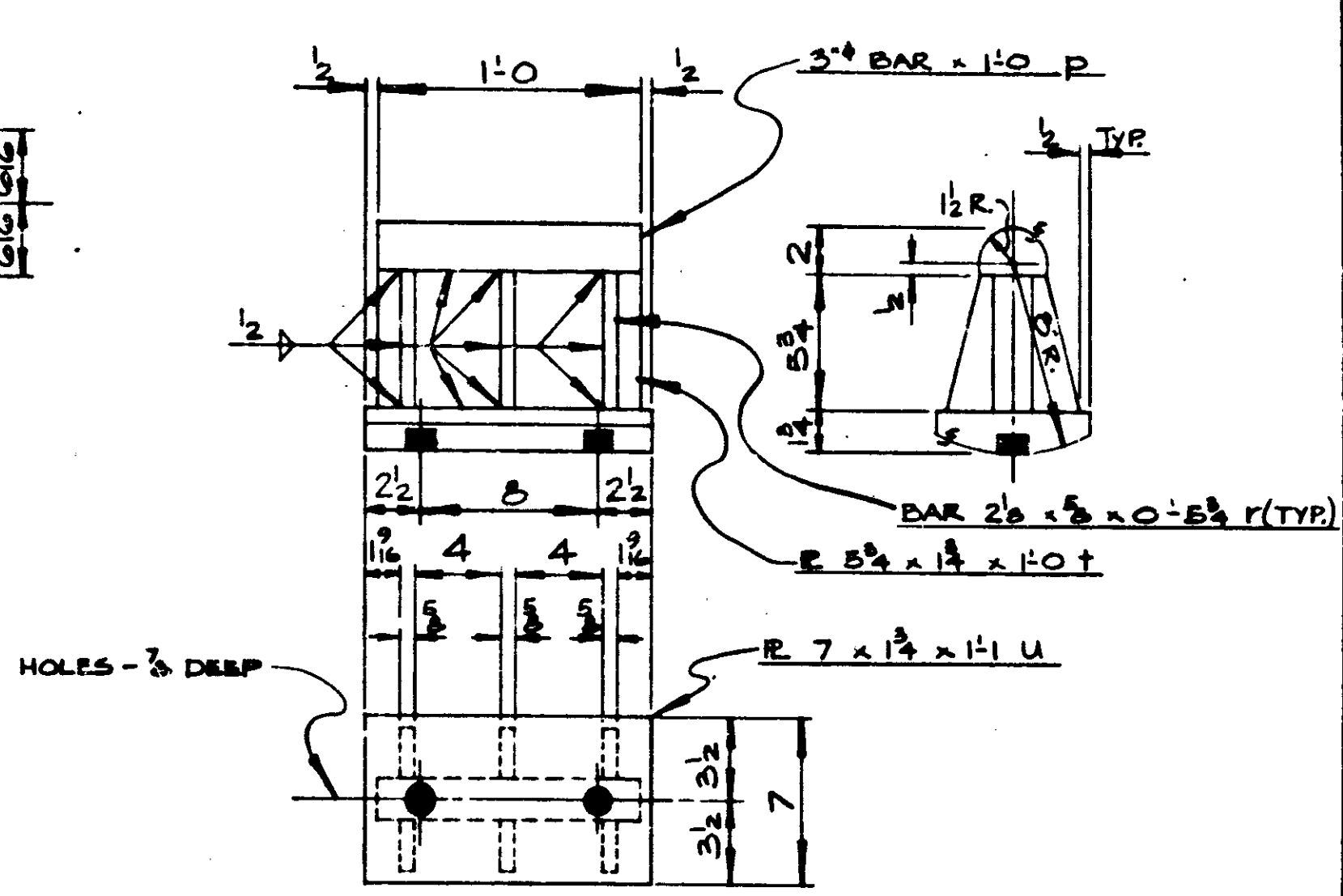
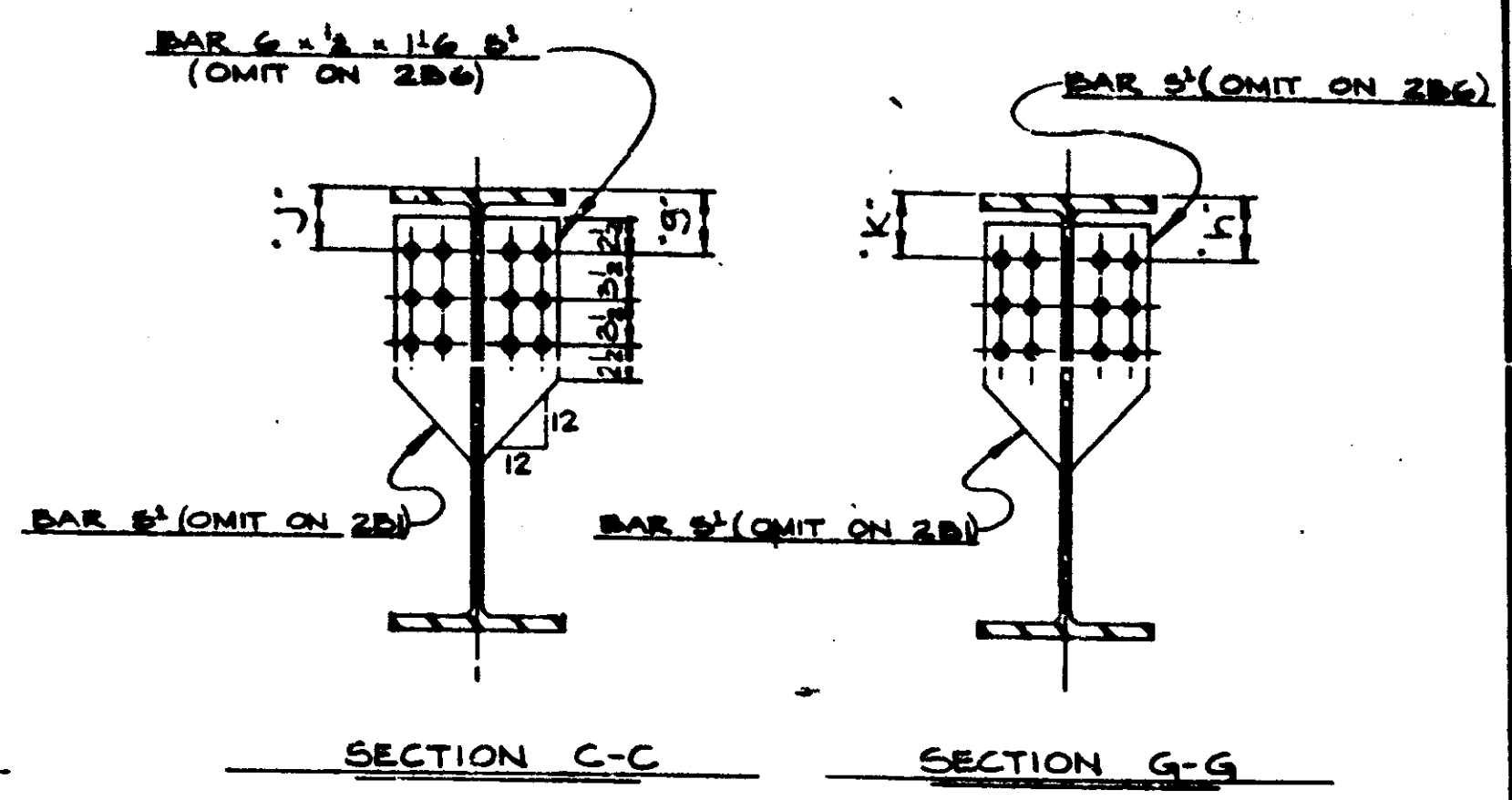
| REVISION |             |      |    | F. YEAGER<br>BRIDGE & CULVERT COMPANY<br>1701 KEARNEY ST. — PORT HURON, MICH.   |         |
|----------|-------------|------|----|---|---------|
| NO.      | DESCRIPTION | DATE | BY |   |         |
|          |             |      |    | BRIDGE B2 OF 16-5-6, C1<br>175 (US27 RELOC.) S.B. CROSSING RONDO<br>ROAD, 3.6 MILES N.E. OF WOLVERINE,<br>CHEBOYGAN COUNTY.<br>MICH. BRIDGE CONSTRUCTORS, CONT'R. |         |
|          |             |      |    |   |         |
|          |             |      |    |   |         |
|          |             |      |    |   |         |
|          |             |      |    |   |         |
|          |             |      |    | DATE 4-3-61   | JOB NO. |
|          |             |      |    | BY JAM  | R 21211 |
|          |             |      |    |   | E1      |







|     | a'    | b'    | c'    | d'    | e'    | f'    | g'    | h'    | j'    | k'    |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2B1 | 2 5/8 | 2 5/8 | 6 3/4 | 6 3/4 | 7 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 |
| 2B2 | 2 5/8 | 2 5/8 | 6 3/4 | 6 3/4 | 7 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 |
| 2B3 | 2 5/8 | 2 5/8 | 7     | 6 3/4 | 7 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 |
| 2B4 | 3 1/2 | 3 1/2 | 7 1/2 | 7 1/2 | 7 1/2 | 5 1/2 | 5 1/2 | 4 1/2 | 4 1/2 | 4 1/2 |
| 2B5 | 2 1/2 | 2 1/2 | 7 1/2 | 6 3/4 | 6 3/4 | 5     | 5     | 4 1/2 | 4 1/2 | 4 1/2 |
| 2B6 | 2     | 2     | 6 3/4 | 6 3/4 | 6 3/4 | 5     | 5     | 4 1/2 | 4 1/2 | 4 1/2 |



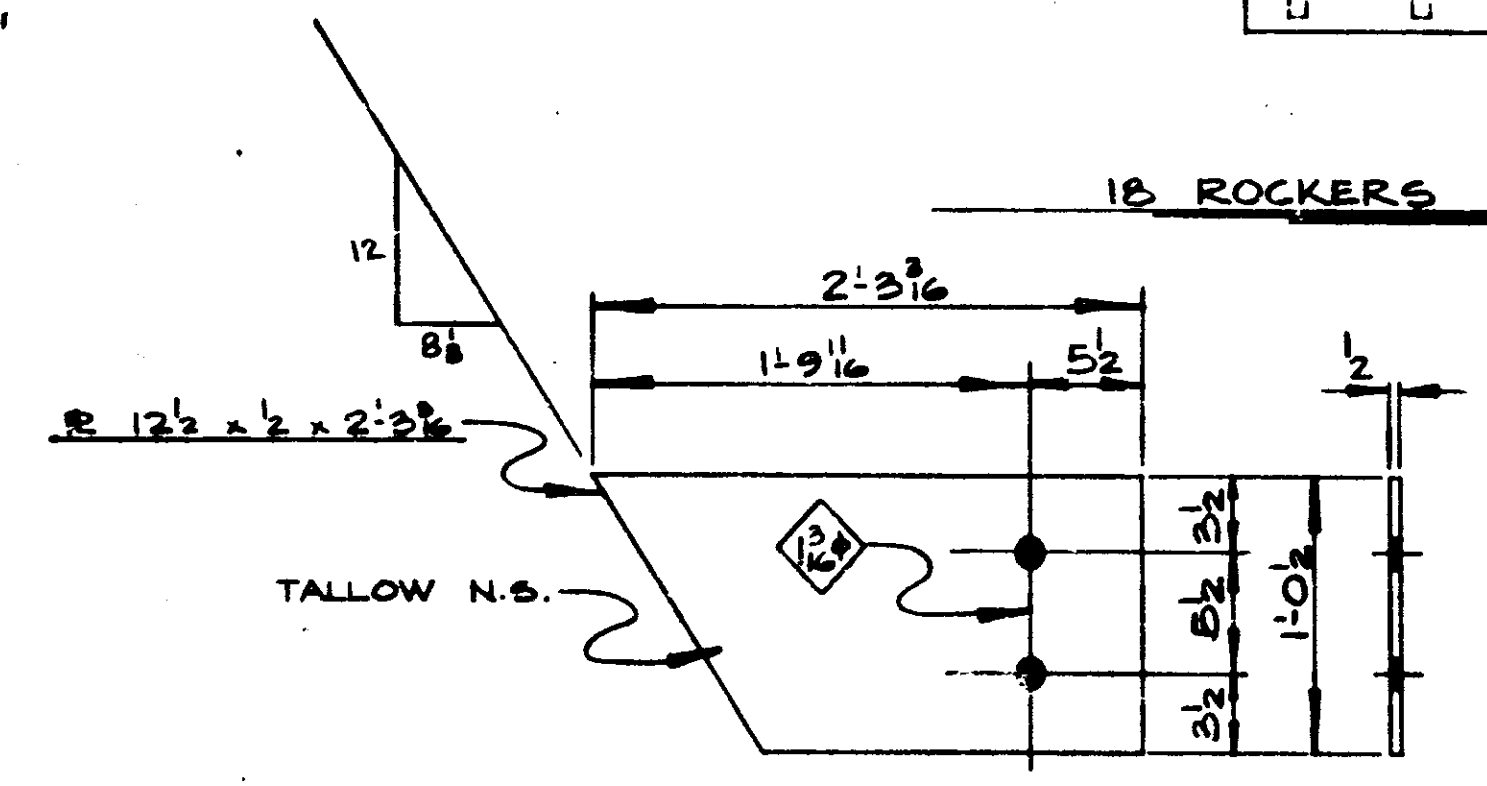
6 BEAMS REQ'D. AS SHOWN & NOTED (A.S.T.M. A373 33 WF 130 x 72'-4) MK. 2B1 THRU 2B6, INCL.  
(ONE BEAM OF EACH MARK.)

L 4 x 4 x 3/8 x 2'-4 1/2 ba<sup>1</sup> FOR 2B1 + 2B2.  
do. x 2'-4 1/2 bb<sup>1</sup> FOR 2B2.  
do. x 2'-5 1/4 bc<sup>1</sup> FOR 2B4.  
do. x 2'-5 1/4 bd<sup>1</sup> FOR 2B5.

L ba<sup>1</sup> FOR 2B4, 2B5, + 2B6.  
L bc<sup>1</sup> FOR 2B2.  
L bd<sup>1</sup> FOR 2B3.

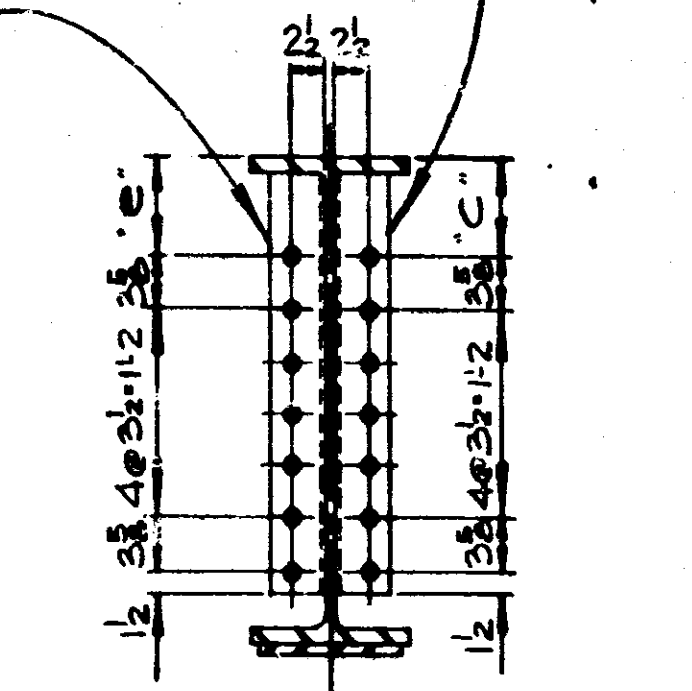
L ba<sup>1</sup> FOR 2B1, 2B2, + 2B3.  
L bd<sup>1</sup> FOR 2B4.  
L 4 x 4 x 3/8 x 2'-4 1/2 ba<sup>1</sup> FOR 2B5.

L ba<sup>1</sup> FOR 2B5 + 2B6.  
L bd<sup>1</sup> FOR 2B2.  
L bc<sup>1</sup> FOR 2B3.  
L bb<sup>1</sup> FOR 2B4.

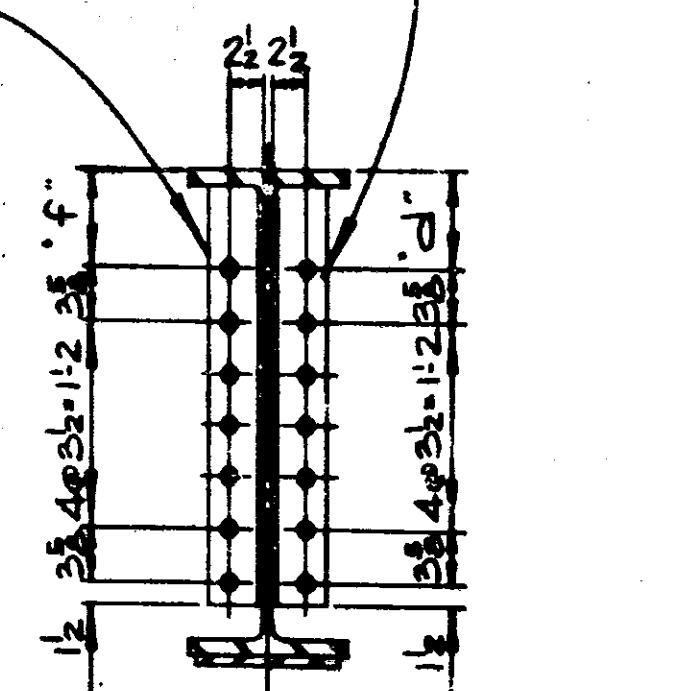


SHOP NOTE: WORK THIS SHEET WITH SHEET 1.

12 MASONRY PLATES REQ'D. AS SHOWN - MK. 2MPI



SECTION A-A

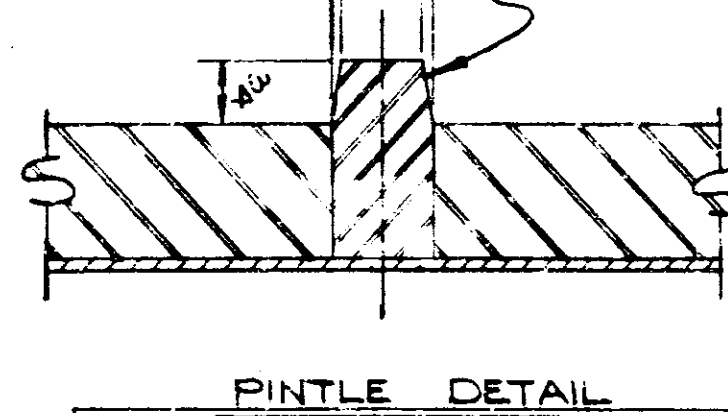
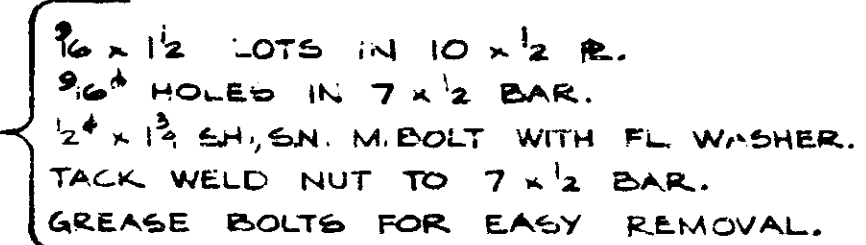
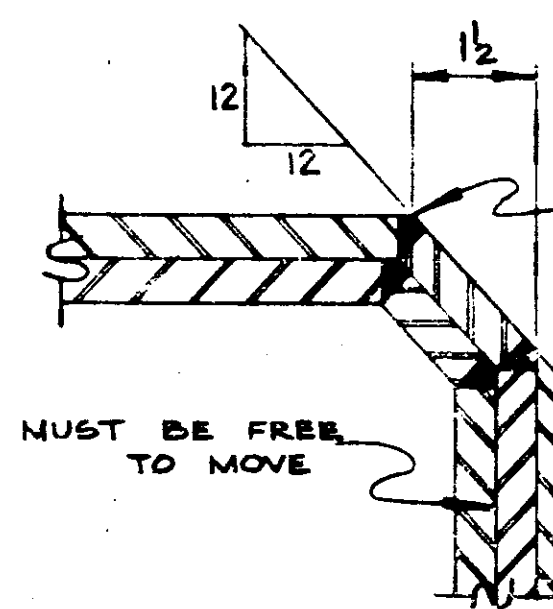


SECTION B-B

| REVISION |             |      |    | F. YEAGER<br>BRIDGE & CULVERT COMPANY<br>1701 KEARNEY ST. - PORT HURON, MICH.   |        |
|----------|-------------|------|----|---|--------|
| NO.      | DESCRIPTION | DATE | BY |   |        |
|          |             |      |    | BRIDGE B2 OF 16-B-6, C1<br>I75 (US27 RELOC.) S.B. CROSSING RONDO<br>ROAD, 3.6 MILES N.E. OF WOLVERINE,<br>CHEBOYGAN COUNTY.<br>MICH. BRIDGE CONSTRUCTORS, CONT'R. |        |
|          |             |      |    |   |        |
|          |             |      |    |   |        |
|          |             |      |    |   |        |
|          |             |      |    | DATE 3-29-61  | 2 OF 4 |
|          |             |      |    | BY JAM  |        |

302 0 00 2 00





| REVISION |             |      |    | F. YEAGER                             |                   |
|----------|-------------|------|----|---------------------------------------|-------------------|
| NO.      | DESCRIPTION | DATE | BY | BRIDGE & CULVERT COMPANY              |                   |
|          |             |      |    | 1701 KEARNEY ST.                      | PORT HURON, MICH. |
|          |             |      |    | BRIDGE B2 OF 16-5-6, C1               |                   |
|          |             |      |    | .75 (US27 RELOC.) S.B. CROSSING RONDO |                   |
|          |             |      |    | ROAD, 3.6 MILES N.E. OF WOLVERINE,    |                   |
|          |             |      |    | CHEBOYGAN COUNTY.                     |                   |
|          |             |      |    | MICH. BRIDGE CONSTRUCTORS, CONT'R.    |                   |
|          |             |      |    | DATE 3-31-61                          | JOB NO.           |
|          |             |      |    | BY JAM                                | R 21211           |
|          |             |      |    |                                       | SHEET 4 OF 4      |

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